TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL

AIR CONDITIONER, BASE MOUNTED AIR COOLED; ELECTRIC MOTOR DRIVEN; 120/208 VOLTS, 3 PHASE, 50/60 CYCLE 5 STACK CONFIGURATION (THERMO KING MODEL S18-104 TM 5) FSN 4120-926-1203 (KECO MODEL F18000-6) FSN 4120-168-2044 (MECOM MODEL 19099-G 18000-5-MEC) FSN 4120-406-3222

This copy is a reprint which includes current pages from Changes 1 through 5.

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1970

WARNING
HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.
Learn the areas containing high voltage in each piece of equipment.
Be careful not to contact high-voltage connections when installing or operating this equipment.
Before working inside the equipment, turn power off and ground points of high potential. Disconnect power supply before performing maintenance on the unit.

WARNING
DANGEROUS CHEMICALS

are used in this equipment. Wear goggles when servicing refrigerant system

DEATH

or severe burns may result if personnel fail to observe safety precautions

WARNING
DANGEROUS GASES

are used in the operation of this equipment.

DEATH

or severe injury may result if personnel fail to observe safety precautions.

HANGE
o. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C,

Operator's, Organizational and Direct Support Maintenance Manual

AIR CONDITIONER, BASE MOUNTED, AIR COOLED,
18,000 BTUH, ELECTRIC MOTOR DRIVEN
120/208 VOLTS, 3 PHASE, 50/60 CYCLE,
5 STACK CONFIGURATION
THERMO-KING MODEL S18-104TM5 (NSN 4120-00-926-1203)
KECO MODEL F18000-6 (NSN 4120-00-168-2044)
MECOM MODEL F18000-5MEC (NSN 4120-00-230-2772)
MECOM MODEL G-18000-5MEC (NSN 4120-00-406-3222)
AC MODEL ACBM18 (NSN 4120-00-926-1203)

M 5-4120-298-13, 24 September 1970, is changed as follows:

age i. "Reporting Errors and Recommending Improvements" paragraph. The address o which DA Forms 2028-2 are to be directed is superseded as follows:

Commander
U.S. Army Troop Support Command
ATTN: AMSTR-MCTS
4300 Goodfellow Blvd.,
St. Louis, MO 63120-1798

age 3-2. Tables 3-1 and 3-2 are superseded by new tables 3-1 and 3-2.

age 4-2. Table 4-1 is superseded by new table 4-1.

Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

ficial:

R. L. DILWORTH
igadier General, United States Army
The Adjutant General

STRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator's, Unit, Direct upport and General Support Maintenance Requirements for Air Conditioner, Base ounted, Air Cooled, 5 Stack Configuration, 18,000 BTU, 120/208V, 50/60HZ, 3PH, 18000-6, F18000-5MEC, G18000-5MEC, S18-104TM5, ACBM18).

Table 3-1. Operator/Crew Preventive Maintenance Checks and Services

NOTE

Within the designated interval, these checks are to be performed in the order listed.

D-During

Item No.	Interval D	Item to be Inspected	Procedures: Check for and have repaired or adjusted as necessary.	Equipment Is Not Ready/ Available If:
1	●	Air conditioner	a. Check that grilles are clear and free of debris. b. Check for proper temperature output, operation of fans, compressor, and controls. Check for unusual noises, rough running, excessive vibration, and loose or missing parts. If a component failure is suspected, notify organization maintenance.	Grilles can not be cleared of obstructions. Output is too/ low or a component/part is defective.

Table 3-2. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Air conditioner fails to start	a. Controls not properly set.	a. Set controls for starting (para 2-8).
	b. Power supply leads loose.	b. Tighten leads (para 2-2).
2. Air conditioner noisy during operation	Panels loose.	Tighten fasteners. Replace defective fasteners (para 3-9).
3. Insufficient cooling	a. Thermostat switch improperly set (fig. 2-3).	a. Set thermostat switch for cooler operation
	b. Service or shutoff valves not open.	b. Open refrigerant valves (para 2-2).
4. No cool air discharge	a. Selector switch in wrong position.	a. Set selector switch for cooling (fig. 2-3).
	b. Thermostat switch improperly set.	b. Set thermostat switch for cooling (fig. 2-3).
	c. Filter dirty.	c. Clean filter (para 3-10).
	d. High pressure cutout switch tripped.	d. Reset high pressure cutout switch (fig. 2-2).
	e. Thermal overload switch tripped.	e. Allow motor to cool and reset itself.
5. Excessive cooling	Thermostat switch set for too cool operation.	Set thermostat for desired temperature (fig. 2-3).

Table 4-1. Organizational Preventive Maintenance Checks and Services

NOTE: Within designated interval, these checks are to be performed in the order listed.

W-Weekly Q-Quarterly

Item No.	Interval W	Interval Q	Item to be Inspected	Procedure: Check for and have repaired, replaced cleaned, or adjusted as necessary. Perform all operator PMCS first.
1	●		Air filter	Clean or replace filter.
2	●		Refrigerant system	Check refrigerant lines are free of chafing, bends, and kinks. Check that fittings and caps are tight and free of leaks. Check that clamps are in place and secure. Pay particular attention to flexible lines and clamps which connect to compressor. Check evaporator and condenser for leaks and damage (bent, kinked, crushed, etc.).
3	●		Compressor oil sight glass	Check that compressor oil level is approximately at midpoint in sight glass.
4	●		Refrigerant sight glass	Operate air conditioner in maximum cool mode for 20 minutes. Check sight glass. Glass must be free of bubbles.
5		●	Wiring and fan motors	Check for missing, burnt, broken, or loose wiring or insulation. Check for loose or broken connections. Check motors for overheating and loose mountings. Rotate fans and check motors for bearing noise and that fans are not rubbing. Check and tighten fan setscrews.
6		●	Compressor	Check compressor for secure mounting and for evidence of leaks. Check flexible drive coupling. Coupling must be securely mounted and free from damage and wear.

Section V. TROUBLESHOOTING

4-9. General.

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the air conditioning unit and its components. Each malfunction listed is followed by a list of probable causes of the trouble. The corrective action recommended is described opposite the probable cause. Any trouble beyond the scope of organizational maintenance shall be reported to direct support maintenance.

4-10. Organizational Troubleshooting.

Refer to table 4-2 for organizational troubleshooting.

Change
No. 1

HEADQUARTERS
DEPARTMENT OF THE AR
Washington, D. C., *8 February*

Operator, Organizational and Direct Support Maintenance Manual
AIR CONDITIONER, BASE MOUNTED, AIR COOLED, 18,000 BTUH, ELECTRIC MOTOR DRIVEN, 120/208 VOLTS, 3 PHASE, 50/60 CYCLE, 5 STACK CONFIGURATION
THERMO KING MODEL S18-104TM5 (FSN 4120-926-1203) KECO MODEL F18000-6 (FSN 4120-168-2044) MECOM MODEL F18000-5MEC (FSN 4120-230-2772) MECOM MODEL G18000-5MEC (FSN 4120-406-3222)

TM 5-4120-298-13, 24 September 1970, is changed as follows:

Cover and page i. The TM title is changed as indicated above.

Page iii. Title for figure 4-8, "Compressor and motor alignment (Keco Model F18000-6 and MECOM Model 19099G18000-5MEC)" is changed to read "Compressor and motor alignment (Keco Model F18000-6, MECOM Model F18000-5MEC and MECOM Model G18000-5MEC) (Sheet 2 of 2)".

Page iii. Title for figure 7-1, "Compressor" is changed to read "Compressor, Thermo King."

Page iii. "Figure 7-2, Compressor, Keco and MECOM Models, partial exploded view, Page 7-5" is added to list of illustrations.

Page 1-1, paragraph 1-1a. The first sentence is superseded as follows:

a. These instructions are published for the use of personnel maintaining the air conditioners (Keco Model F18000-6, MECOM Model F18000-5MEC, MECOM Model G18000-5MEC, and Thermo King Model S18-104TM5) as allocated by the Maintenance Allocation Chart.

Page 1-4. Paragraph 1-4 is superseded as follows:

1-4. Differences Between Models

This manual covers the Thermo King Model S18-104TM5, Keco Model F18000-6, MECOM Model F18000-5MEC and MECOM Model G18000-5M The only difference between the models is tha MECOM Model F18000-5MEC utilizes an automo type compressor manufactured by Keco-York. the other models use the standard Thermo- compressor.

Page 1-4. Paragraph 1-5*a* first sentence is su seded as follows:

a. Identification. The Keco Model F180 MECOM Model F18000-5MEC, MECOM M G18000-5MEC and the Thermo King Model 104TM5 each have one major identification plate.

Page 1-4. Paragraph 1-5*a* (2) is superseded as lows:

(2) *MECOM models.*

Manufacturer	MECOM
Model	F18000-5MEC (Formerly K Model F18000-5)
FSN	4120-230-2772
Model	G18000-5MEC (Formerly K Model G18000-5)
FSN	4120-406-3222

Page 1-4. Paragraph 1-5*b*, "NOTE" is super as follows:

NOTE

The following data are identical for the Keco Model F1 MECOM Model F18000-5MEC and the MECOM Model G 5MEC.

Page 1-4. Paragraph 1-5*b* (1) *(h)* is superseded follows:

(h) Compressor (Thermo King Model S18-104TM5, Keco Model F18000-6, and MECOM Model G18000-5MEC).

Manufacturer	Thermo King Corp.
Part Number	52070
Model	2S19M
Type	Reciprocating 2 cylinder open type

Page 1-4. Paragraph 1-5b (1) Subparagraph (h.1) is added as follows:

(h.1) Compressor (MECOM Model F18000-5MEC).

Manufacturer	York-Keco
Part Number	54237
Model	RDA206
Type	Reciprocating 2 cylinder open type

Page 1-5. The caption of figure 1-3 is superseded as follows:

Figure 1-3. Wiring diagram (Keco Model F18000-6, MECOM Model F18000-5MEC and MECOM Model G18000-5MEC.

Page 1-6, paragraph 1-5 b (2). Subparagraphs *(n)* and *(o)* are added as follows:

(n) Refrigerant.

Type	R12
FSN	6830-292-0147
Amount of Charge Required:	
Thermo King	13 lbs.
Keco	13 lbs.
MECOM	15.5 lbs.

(o) Refrigerant oil.

Type	RC0-2
FSN	9150-598-2911
Unit of Issue	1 qt. can
Quantity Required:	
Thermo King Compressor	7 pts.
Keco-York Compressor	10 oz

Page 2-1. Paragraph 2-2*b* (2) is superseded as follows:

(2) Connect a power source cable of 120/208 V, 3 phase, 50/60 cycle to the terminal board TB 1 (fig. 1-3) in the compressor section for the Keco Model F18000-6, MECOM Model F18000-5MEC and MECOM Model G18000-5MEC or to the magnetic contactor (fig. 1-4) in the compressor section for the Thermo King Model S18-104TM5.

Page 4-13. Paragraph 4-23*c* (3) is superseded as follows:

(3) Check for alignment using figure 4-8 and the following instructions:

(a) Set shims under the compressor (fig. 4-8) and align, if necessary, so that the flange faces are parallel within 0.010 inch. This can be checked along the complete surface with a 1 1/8 inch spacer block, and a 0.010 inch feeler as a no-go gage.

(b) With alignment assured tighten the bolts of the compressor subbase to the frame. TORQUE BOLTS FROM 12 TO 15 FT. LBS.

(c) Assemble the flexible joint between the oval flanges. TORQUE BOLTS FROM 8 TO 10 FT. LBS.

(d) Place a metal tag on the compressor with information stamped on the TAG as follows: COMPRESSOR SHAFT ROTATION MUST BE CLOCKWISE AS VIEWED FROM THE SHAFT END.

Page 4-13. Figure 4-8 is superseded as follows:

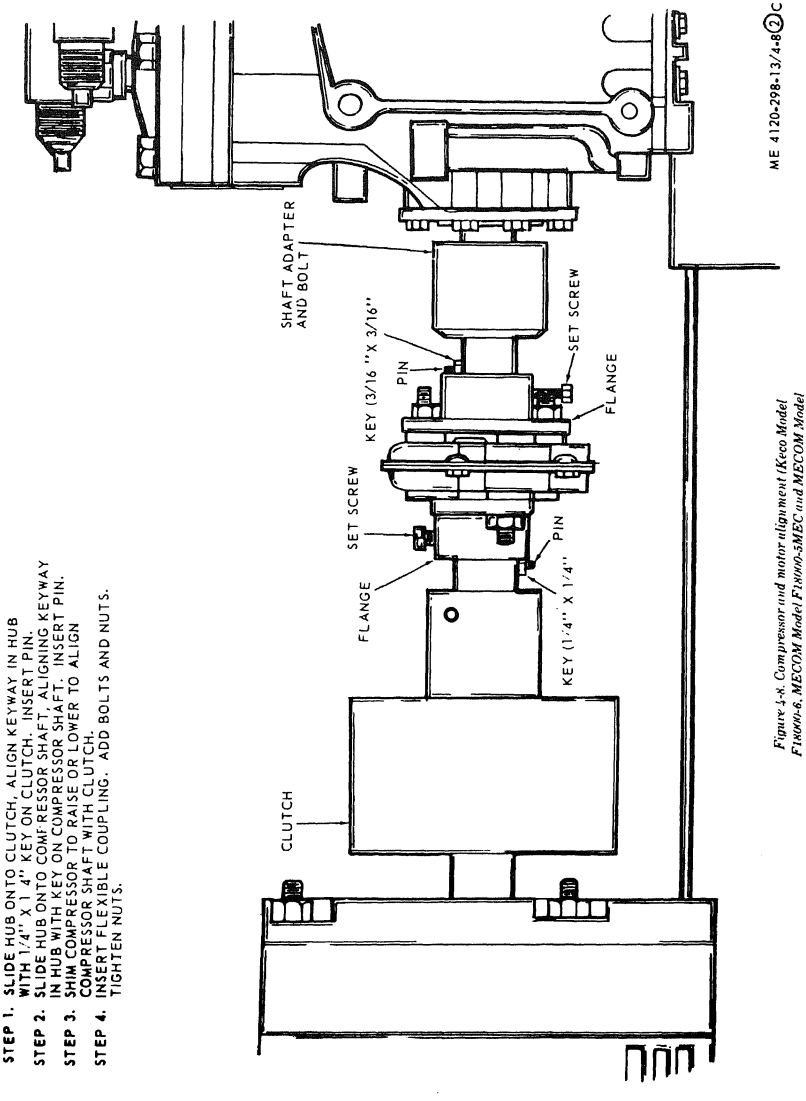


Figure 4-8. Compressor and motor alignment (Keco Model F1K090-6, MECOM Model F1K090-5MEC and MECOM Model G1K090-5MEC) (Sheet 2 of 2).

Page 5-3, Paragraph 4-10a. In lines 4 and 5, "13.0 pounds of R-12 is the normal refrigerant charge when shipped," is deleted.

Page 5-4. Paragraph 5-12*b* is superseded as follows:

b. Connect the refrigerant charging hookup as shown in figure 5-1 with a full drum of R-12. Weigh the drum so that proper amount can be measured into the system.

NOTE

The R-12 drum for recharing should be equipped with large capacity drier. The Thermo King and Keco units require 13 lbs. of R-12. The MECOM units require 15.5 lbs. of R-12.

Page 5-4. Paragraph 5-12*g* is superseded as follows:

g. Start unit and run until proper amount of R-12 is added.

Page 5-10. Paragraph 5-21*d* is superseded as follows:

d. Adjust. Tape the bulb of a thermometer to suction line near sensing element of expansion valve. Install a pressure gage to read suction pressure. Operate the unit on cool for approximately 30 minutes (Thermometer reading must stabilize). Check thermometer and pressure gage. To the suction pressure, add estimated suction line loss (2 psi). Convert this R-12 suction pressure to temperature, and subtract from temperature reading of suction line. For all models except MECOM Model F18000-5MEC, the superheat should be 4° F. For MECOM Model F18000-5MEC the superheat is 1° to 2° F. Remove seal cap on side of valve and turn adjusting stem. Turning adjusting stem to left increases flow and lowers superheat. Turning stem to right decreases flow and raises superheat. Except for MECOM Model F18000-5MEC, four complete turns will raise or lower superheat approximately 2° F.

Page 7-1. The title of paragraph 7-1 is changed as follows:

7-1. Compressor Repair (Thermo-King)

The caption of figure 7-1 is changed as follows:

Figure 7-1. Commpressor (Thermo King).

Page 7-2. The title of paragraph 7-2 is changed as follows:

7-2. Compressor Overhaul (Thermo King)

Page 7-3. Paragraph 7-3 is added as follows:

7-3. Compressor Repair (Keco-York)

a. General. The compressor (fig. 7-2) is a two cylinder piston-type pump constructed mainly of cast aluminum. The aliminum alloy pistons and the cast iron cylinder sleeves are machined to very close tolerance so piston rings are not required to prevent gas from escaping. The pistons are driven in a reciprocating motion by a forged steel crankshaft. The compressor is equipped with a rotary-type refrigeration seal to prevent leakage around the drive shaft.

Figure 7-2 is added as follows:

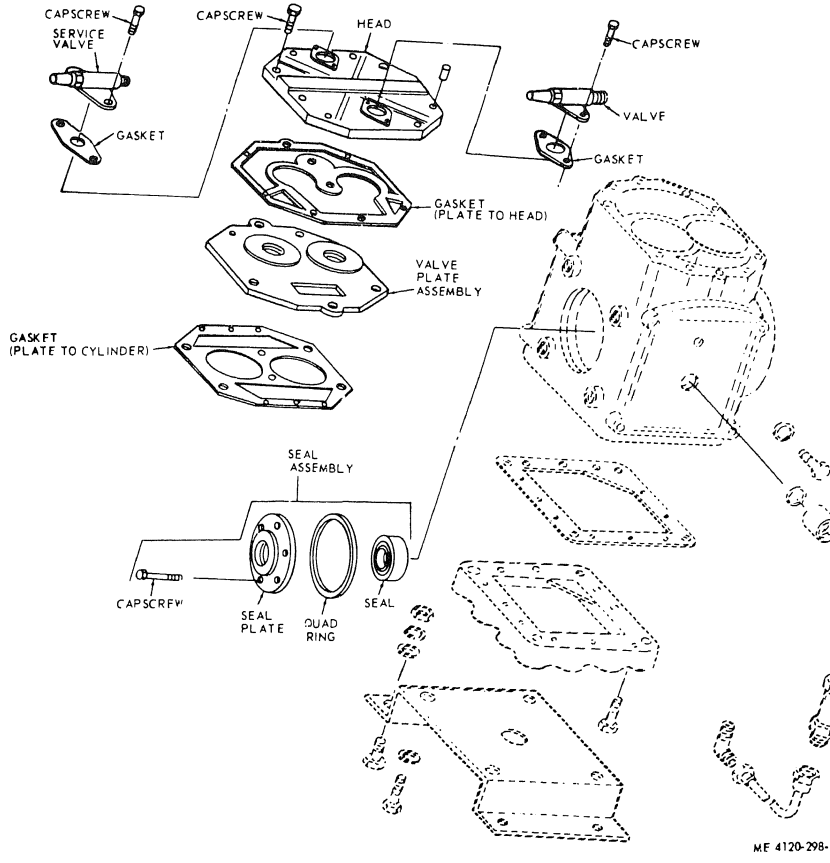


Figure 7-2. Compressor, Keco-York and MECOM Models, partial exploded view.

b. Repair. The compressor will be repaired at the Direct Support Level of Maintenance to the extent of replacing the service valves, valve plate assembly, gaskets, and shaft seal assembly.

c. Removal.

NOTE

Before removing the compressor from the unit, note the oil level in the compressor sight glass, and make sure oil level is the same in the compressor when reinstalled. The compressor oil capacity is 10 oz. and RC0-2 type refrigerant oil (FS 598-2911) is required.

(1) Refer to paragraph 5-8 and pump dov refrigerant system.

(2) Close (front seat) the discharge and s service valves, and remove the mounting cap s to remove the valves.

(3) Remove line to high pressure cutout swi

(4) Remove the screws from the compressor side of the flexible coupling, and remove the compressor mounting bolts.

d. Replacement of Shaft Seal Assembly.

(1) *Removal.*

(a) Remove the clutch and the key from the compressor shaft (fig. 4-8).

(b) Remove the seal plate capscrews (fig. 7-2) and gently pry the seal plate loose, being careful not to mar or scratch the flat sealing surfaces or the polished shaft surface.

NOTE

When removing the seal plate, a hand should be held under the seal housing to catch the carbon ring if it is free.

(c) Do not pry or force the carbon ring with a hard sharp object in such a manner as to damage the carbon ring. In some cases it may be bonded to the retainer.

(d) Remove the seal assembly from the shaft by prying behind the drive ring which is that portion of the seal assembly farthest back on the shaft.

NOTE

When prying the seal assembly from the shaft, do not scratch or burr the crankshaft or the seal housing face on the crankcase.

(2) *Installation.*

CAUTION

Replacement shaft seals are furnished only as complete assemblies and should be installed as such. NEVER MATE A COMBINATION OF NEW AND USED PARTS.

(a) Check the face of the crankshaft front bearing journal in the seal housing to make certain that there are no nicks or burrs. Check shaft surface to be sure it is not cut scratched. Check all parts of seal assembly to be installed for transit or handling damage.

(b) Wash all portions of the seal assembly in clean refrigeration oil.

(c) The seal assembly on the compressor uses a quad ring inserted into a groove in the seal housing.

(d) Push the seal assembly, less the carbon ring, if it is free, over the end of the shaft with the carbon ring retainer facing out. Place the carbon ring in the ring retainer so the polished surface is facing outward. The indentations in the outside edge of the carbon ring must engage the driving lugs and be firmly seated in the retainer. Use the seal cover plate as a pusher to move the seal assembly into position on the shaft.

(e) Insert the capscrews. Turn in the capscrews evenly making sure there is even clearance between the shaft and shaft hole in the face plate. If clearance is not the same all around the shaft, gently tap the seal face plate into a position where there is equal clearance. When equal clearance is obtained, tighten all the capscrews by tightening capscrews evenly to the required 7 to 13 ft. lbs.

e. Replacement of Valve Plate Assembly and Service Valves.

(1) *Removal.*

(a) Remove the capscrews from flanged type service valves. Note that these four capscrews are longer than the remaining capscrews. If the valves are of the rotalock type, remove by loosening the hex nuts which are a part of the rotalock assembly.

(b) Remove the remaining capscrews and washers in the head (fig. 7-2) and remove the valve plate and head from the cylinder by prying or tapping under the ears which extend from the valve plate. If the head and valve plate adhere, hold the head and tap the valve plate ears away from the head with a soft hammer. Do not hit or tap the heat to separate the head and valve plate because damage to the head may result.

(c) All gasket material adhering to the head, valve plate, or cylinder should be removed being careful not to scratch or nick the machined sealing surfaces.

(2) *Installation.*

NOTE

The valve plate is furnished only as a complete assembly.

(a) Apply a thin film of clean refrigeration oil on the area of the crankcase to be covered by the cylinder gasket. Place the plate to cylinder gasket (fig. 7-2) in position on the cylinder so the dowel pins in the crankcase go through the dowel pin holes in the cylinder gasket.

(b) Apply a thin film of clean refrigerant oil to the top and bottom valve plate areas to be covered by gaskets. Place the valve plate in position on the cylinder gasket so the discharge valve assemblies (i. e. the smaller diameter assemblies with the restrainer over the valve reed) are facing up and the locating dowel pins go through the dowel pin holes in the valve plate.

(c) Place the plate to head gasket (fig. 7-2) in position so the dowel pins slip through the dowel pin holes in the gasket.

(d) Apply a light film of clean refrigerant oil on the machined surface of the cylinder head which matches the head gasket. Place the head on the cylinder head gasket so the dowel pins go into the dowel pin holes in the head.

(e) Apply a thin film of clean refrigeration oil to the service valve flanges and the flange-type service vlaves. Place a service valve gasket (fig. 7-2) in position on the cylinder head service valve flanges. Place the service valves in position on the proper service valve ports (suction or discharge) and insert the four longer capscrews through the service valve mounting pads, the head, the valve plate, and into the crankcase.

NOTE

For oval gasket service valves apply 8 to 13 ft. lbs. of torque to capscrews. For Rotalock service valve apply 30 to 35 ft. lbs. to capscrews.

Insert the remaining head capscrews, and run in all capscrews until the heads make contact. Tighten the head and service valve capscrews (usi wrench) from 15 to 23 lbs. Tighten the se capscrews first, then tighten the rema screws in a staggered sequence.

By Order of the Secretary of the Army:

W. C. WESTMOR
General, United St
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-25, Section III (qty rqr block no. 545) Oper-at nance requirements for Air Conditioners, 18,000 BTU, Floor Mounting.

Change
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARM
Washington, D. C., *1 November 1*

Operator, Organizational and Direct Support Maintenance Manual

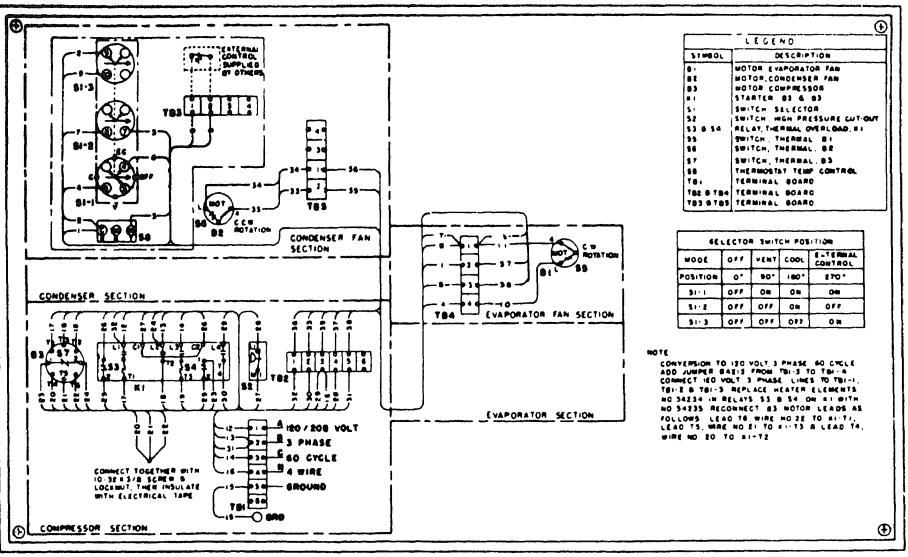
AIR CONDITIONER, BASE MOUNTED, AIR COOLED, 18,000 BTUH, ELECTRIC MOTOR DRIVEN 120/208 VOLTS, 3 PHASE, 50/60 CYCLE, 5 STACK CONFIGURATION THERMO KING MODEL S18-104TM5 (FSN 4120-926-1203) KECO MODEL F18000-6 (FSN 4120-168-2044) MECOM MODEL F18000-5MEC (FSN 4120-230-2772) MECOM MODEL G18000-5MEC (FSN 4120-406-3222)

TM 5-4120-298-13, 24 September 1970, is changed as follows:

Page 1-5. The caption of figure 1-3 is superseded as follows:

Figure 1-3. Wiring diagram (Keco model F18000-6 and MECOM Model G18000-5MEC)

Page 1-5. Figure 1-3.1 is added after figure 1-3.



ME 4120-298-13/1-3.1 C2

Figure 1-3.1. Wiring diagram (MECOM Model F18000-5MEC).

Page 1-6. In Subparagraph 1-5*b* (2) *(n)*, line 6, "15.5 lbs." is changed to read "13.5 lbs.".

Page 1-6. In subparagraph 1-5*b* (2) *(o)*, line 5, "7 pts." is changed to read "1 qt".

Page 4-16. Subparagraph 4-26*b* (3) is superseded as follows:

(3) Refer to figure 5-2 for removal of fan assembly from evaporator fan section and refer to figure 5-4 for removal of fan assembly from condensor fan section.

Page 5-2. In subparagraph 5-7*g*, line 5, "Open suction service * * * unit to service." is changed to read "Open discharge valve stem one turn clockwise to return unit to service."

Page C-1. Appendix C is superseded as follows:

APPENDIX C
BASIC ISSUE ITEMS LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED

Section I. INTRODUCTION

C-1. Scope

This appendix lists items required by the operator for operation of the air conditioner.

C-2. General

This list is divided into the following sections:

a. Basic Issue Items List—Section II. Not applicable.

b. Items Troop Installed or Authorized List—Section III. A list of items in alphabetical sequence, which at the discretion of the unit commander may accompany the air conditioner. These items are NOT subject to turn-in with the air conditioner when evacuated.

C-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of Basic Issue Items List, Section II, and Items Troop Installed or Authorized, Section III.

a. Source, Maintenance, and Recoverability Code(s) (SMR).

(1) Source Code, indicates the source for the listed item. Source codes are:

Code	*Explanation*
P	Repair parts, special tools and test equipment supplied from GSA/DSA or Army supply system and authorized for use at indicated maintenance levels.
P2	Repair parts, special tools and test equipment which are procured and stocked for insurance purposes because the combar or military essentiality of the end item dictates that a minimum quantity be available in the supply system.

(2) Maintenance Code, indicates the lowest level of maintenance authorized to install the listed item. The maintenance level code is:

Code	*Explanation*
C	Crew/Operator

(3) Recoverability Code, indicates whether serviceable items should be returned for reco or salvage. Items not coded are non-recover Recoverability codes are:

Code	*Explanation*
R	Applied to repair parts (assemblies and compor special tools and test equipment which are cons economically reparable at direct and general su maintenance levels.
S	Repair parts, special tools, test equipment ar semblies which are economically reparable at DS GSU activities and which normally are furnish supply on an exchange basis.

b. Federal Stock Number. This column indi the Federal stock number assigned to the item will be used for requisitioning purposes.

c. Description. This column indicates the Fe item name and any additional description o item required.

d. Unit of Measure (U/M). A 2 character a betic abbreviation indicating the amount or qua of the item upon which the allowances are b e.g., ft, ea, pr, etc.

e. Quantity Furnished With Equipment only). This column indicates the quantity of an furnished with the equipment.

f. Quantity Authorized (Items Troop Install Authorized Only). This column indicates the tity of the item authorized to be used with equipment.

g. Illustration (BIIL Only). This column is d as follows:

(1) *Figure number.* Indicates the figure nu of the illustration in which the item is shown.

(2) *Item number.* Indicates the callout nu used to reference the item in the illustration.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR code	(2) Federal stock number	(3) Description: Ref. No. & Mfr code / Usable on code	(4) Unit of meas	(5) Qty auth
PC	7520-559-9618	CASE, MAINTENANCE AND OPERATIONAL MANUAL	EA	1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS,
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25C (qty rqr block No. 545) operator maintenance requirements for Air Conditioners, 18,000 BTU, Floor Mounting.

CHANGE
NO. 3

HEADQUARTERS
DEPARTMENT OF THE AI
WASHINGTON, D.C., *11 March*

Operator's, Organizational and Direct Support Maintenance Manual AIR CONDITIONER, BASE MOUNTED, AIR COOLED, 18,000 BTUH, ELECTRIC MOTOR DRIVEN, 120/208 VOLTS, 3 PHASE, 50/60 CYCLE, 5 STACK CONFIGURATION, THERMO-KING MODEL S18-104TM5, NSN 4120-00-926-1203, KECO MODEL F18000-6, NSN 4120-00-168-2044, MECOM MODEL F18000-5MEC, NSN 4120-00-230-2772, MECOM MODEL G-18000-5MEC NSN 4120-00-406-3222

TM 5-4120-298-13, 24 September 1970, is changed as follows:
The title is changed as shown above.
Page 2 of cover. Add the following warning to the list of safety precautions.

WARNING

The burning of polyurethane foams is dangerous. Due to the chemical composition of a polyurethane foam, toxic fumes are released when it is burned or heated. If it is burned or heated indoors, such as during a welding operation in its proximity, precautions should be taken to adequately ventilate the area. An exhaust system equivalent to that of a paint spray booth should be used. Air supplied respirators, approved by the National Institute for Occupational Safety & Health or the U.S Bureau of Mines, should be used for all welding in confined spaces and when ventilation is inadequate. Individuals who have chronic or recurrent respiratory conditions, including allergies and asthma, should not be employed in this type of environment.

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25C, (qty rqr block No. 545) Ope ·ator maintenance requirements for Environmenta Equipments, Air Conditioners, 18,000 BTU, Floor Mounting.

CHANGE NO. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D C, *2 August 19*

Operator's, Organizational and Direct Support Maintenance Manual

AIR CONDITIONER, BASE MOUNTED, AIR COOLED, 18,000 BTUH, ELECTRIC MOTOR DRIVEN, 120/208 VOLTS, 3 PHASE, 50/60 CYCLE, 5 STACK CONFIGURATION
THERMO-KING MODEL S18-104TM5 (NSN 4120-00-926-1203)
KECO MODEL F18000-6 (NSN 4120-00-168-2044)
MECOM MODEL F18000-5MEC (NSN 4120-00-230-2772)
MECOM MODEL G-18000-5MEC (NSN 4120-00-406-3222)
AC MODEL ACBM18 (NSN 4120-00-926-1203)

TM 5-4120-298-13, 24 September 1970, is changed as follows:

The TM title is changed as indicated above.

Page i, Table of Contents, Below line 16, AC MODEL ACBM18 (NSN 4120-00-926-1203) add:

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedu please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Bla Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Troop Supp and Aviation Materiel Readiness Command, ATTN: DRSTS-MTPS, 4300 Goodfellow Blvd., St. Louis, I 63120. A reply will be furnished directly to you.

List of Illustrations, page iii, after figure 1-1 the following is added.

Figure 1-1. Air conditioner, right front, three-quarter view, with shipping dimensions (AC Model ACBM1

List of Illustrations, page iii,after figure 1-2 the following is added.

Figure 1-2.1.Air conditioner, right rear, three-quarter view (AC Model ACBM18).

List of Illustrations, page iii, after figure 1-4 the following is added.

Figure 1-5. Wiring diagram (AC Model ACBM18).

List of Illustrations, page iii figure 6-1, sheet 2 of 2 is superseded as follows:

Figure 6-1. Compressor motor (Thermo-King Model S18-104TM5 and AC Model ACBM18 sheet 1 of 1).

Page 1-1. Paragraph 1-1*a*. The first sentence is superseded as follows:

a. These instructions are published for the use of the personnel maintaining the air conditioners (Keco Model F18000-6, MECOM Model F18000-5MEC, MECOM Model G-18000-5MEC, Thermo-King Model S18-104TM5, and AC Model ACBM18) as allocated by the Maintenance Allocation Chart.

Page 1-1. Paragraph 1-2 is superseded as follows:

1-2. Forms and Records.

DA Forms and Records that you are required to use are explained in TM 38-750.

Page 1-1. Paragraph 1-3*a*. The first sentence is superseded as follows:

a. The Keco Model F18000-6, MECOM Model F18000-5MEC, MECOM Model G-18000-5MEC, Thermo-King Model S18-104TM5 and AC Model ACBM18 are electrically powered, air conditioning units of 18,000 BTU/HR capacity.

Page 1-2. Add figure 1-1.1.

Page 1-3. Add figure 1-2.1.

Page 1-4. Paragraph 1-4 is superseded as follows:

1-4. Differences Between Models.

This manual covers the Keco Model F18000-6, MECOM Model F18000-5MEC, MECOM Model G-18000-5MEC, Thermo-King Model S18-104TM5 and AC Model ACBM18. The only difference between models is that the MECOM Model F18000-5MEC utilizes an automotive-type compressor manufactured by Keco-York. All the other models use the standard Thermo-King compressor.

Page 1-4. Paragraph 1-5*a*. The first sentence is superseded as follows:

a. Identification. The Keco Model F18000-6, MECOM Model F18000-5MEC, MECOM Model G-18000-5MEC, Thermo-King Model S18-104TM5 and AC Model ACBM18 each have one major identification plate.

Page 1-4. Paragraph 1-5*a*. Add subparagraph (4).

(4) AC Model.

NSN	4120-00-926-1203
Part No.	13217E0000
Manufacturer	AC Manufacturing Co.
Contract No.	DAAKO1-76-C-5375
Model	ACBM18

Page 1-6. Paragraph 1-5*b*. Add subparagraph (3).

(3) AC Model ACBM18.

(a) Air conditioner.

Manufacturer	AC Manufacturing Co.
Model	ACBM18
Type	Air cooled
Refrigerant	R12
Capacity	18,000 BTU/HR cooling

(b) Compressor motor.

Manufacturer	Thermo-King
Model	72560-A
Horsepower	2
Voltage	120/208 Volts AC
Phase	Three
Frequency	60/50 Hertz
Speed	1800/1500 RPM
Rotation	Counterclockwise (from shaft end

(c) Fan motors.

Manufacturer	Thermo-King
Model	62001
Horsepower	1/3
Voltage	115 Volts AC
Phase	Single
Frequency	60/50 Hertz
Speed	1725/1425 RPM
Rotation	(when viewed from end of longer shaft)

Evaporator fan motor: clockwise

Condenser fan motor: counterclockwise

(d) Magnetic starter.

Manufacturer	Arrow-Hart
Part No.	34331-U
Coil rating	120 Volts AC
Frequency	60 CPS
Overload relays	2
Contact rating	30 amperes

(e) Overload relay starter.

Manufacturer	Arrow-Hart
Part No.	42417 120 VAC (3 phase) 42410 208 VAC (3 phase)

(f) Main control switch.

Manufacturer	Arrow-Hart
Part No.	82378SD
Positions	4

(g) Temperature control switch.

Manufacturer	Penn Division, Johnson Controls Inc.
Part No.	A19AGA

(h) Pressure control switch.

Manufacturer	Penn Division, Johnson Controls Inc.
Model No.	P70DA-1 with style 13 capillary tube

(i) Wiring diagram. See Figure 1-5.

Page 1-7. Add figure 1-5.

Page 2-1, paragraph 2-2*b*(2). Add second paragraph:

For the AC Model ACBM18, power connection is accomplished by plug and receptacle. Connect a 208 volt, 3 phase, 60/50 Hertz power source cable to receptacle connector located at the left rear portion of the compressor section.

Page 2-1, paragraph 2-2*b*(4) is superseded as follows:

(4) The unit is shipped wired for 208 volt, 3 phase, 50/60 Hertz power. The unit may be converted for 120 volt, 3 phase, 50/60 Hertz power changing the heater elements, adding a jump and reconnecting certain leads (fig. 1-3, 1-4 and 5).

Page 4-3, Table 4-2, Malfunction 3, Corrective tion *b*. Change the first sentence to read:

b. Check starter circuit (fig. 1-3, 1-4 and 1-5).

Page 4-3, Table 4-2, Malfunction 3, Corrective tion *d*. Change the first sentence to read:

d. Check thermostat circuit (fig. 1-3, 1-4 and 1-5

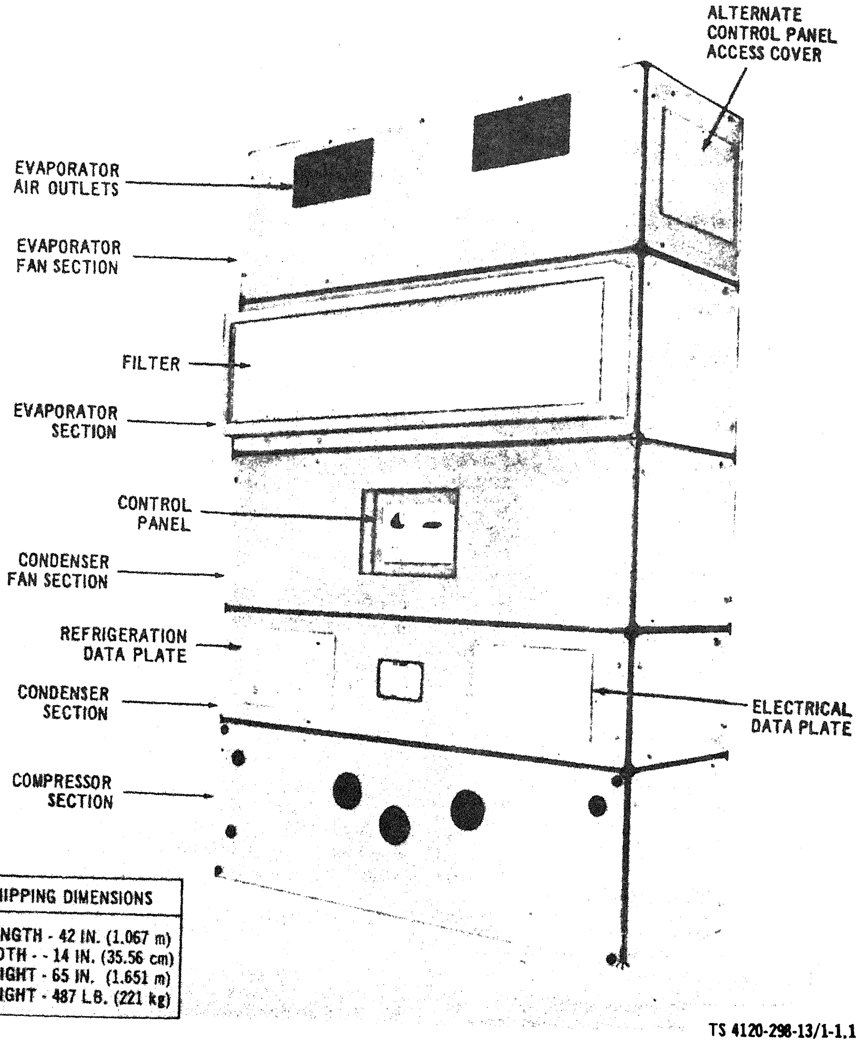
Page 4-3, Table 4-2, Malfunction 5, Corrective tion. Change the first sentence to read:

Check thermostat circuit (fig. 1-3, 1-4 and 1-5

Page 4-6, paragraph 4-18*a*. At the end of the th sentence, change (fig. 1-3 and 1-4) to read: (fig. 1 1-4 and 1-5).

Page 6-2, Figure 6-1 (sheet 2 of 2). The figure title changed as follows:

Figure 6-1. Compressor motor. (Thermo-King Model S18-104TM5 and AC Model ACBM18) (Sheet 2 of 2)



SHIPPING DIMENSIONS
LENGTH - 42 IN. (1.067 m)
WIDTH - - 14 IN. (35.56 cm)
HEIGHT - 65 IN. (1.651 m)
WEIGHT - 487 LB. (221 kg)

Figure 1-1.1. Air conditioner, right front, three-quarter view, with shipping di

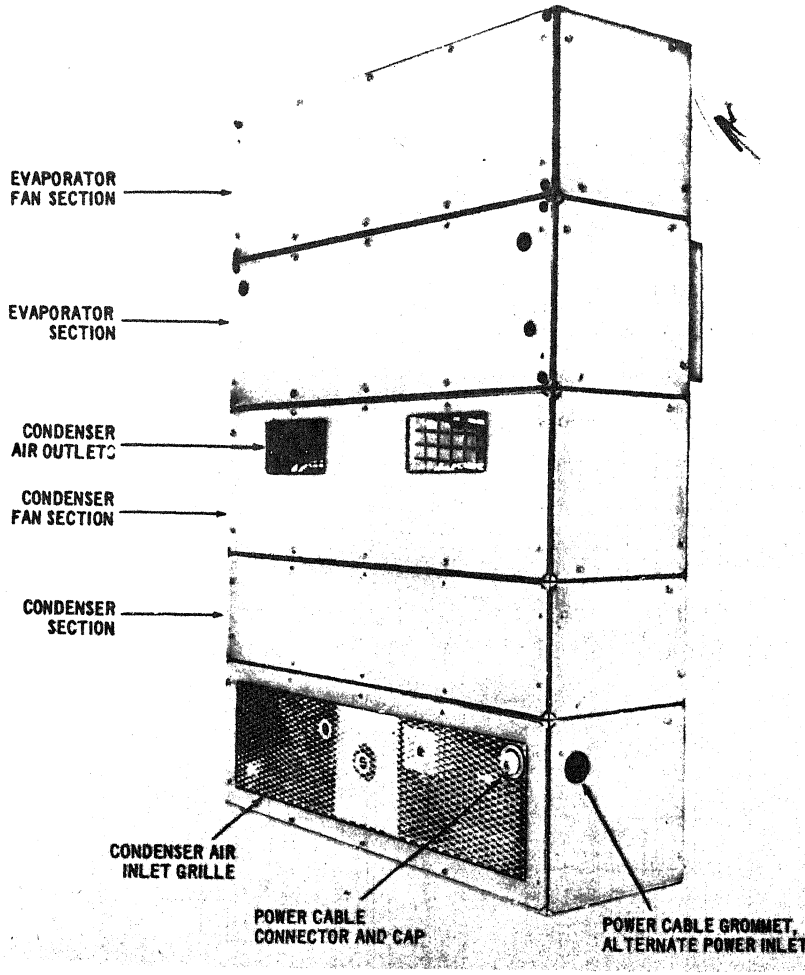
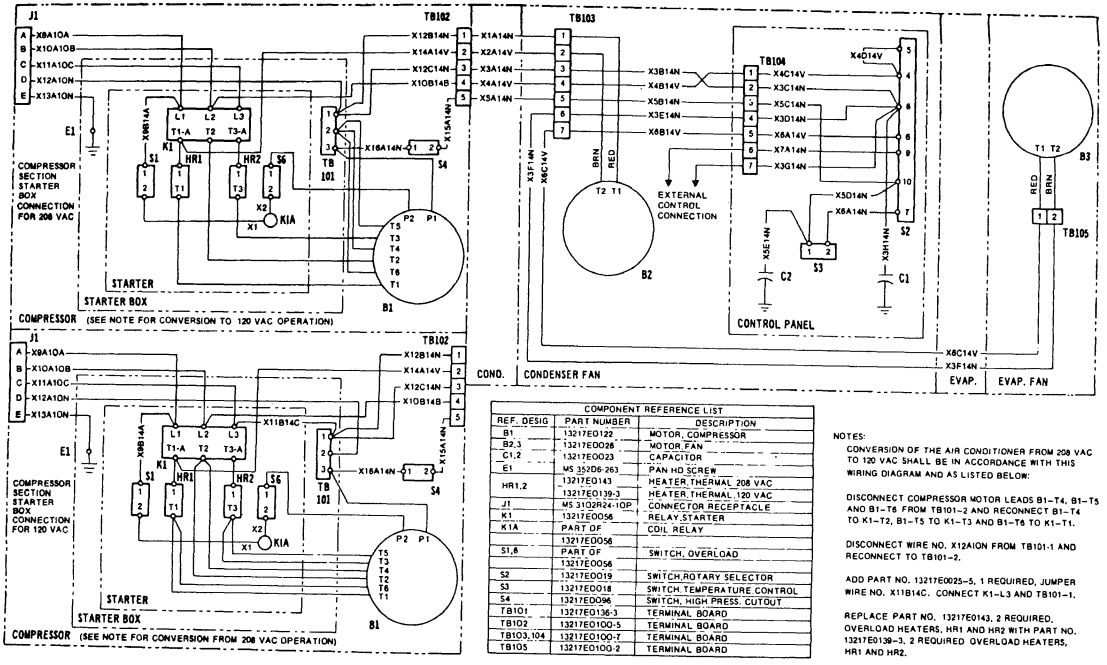


Figure 1-2.1. Air conditioner, right rear, three-quarter view (AC Model ACBM18).



COMPONENT REFERENCE LIST		
REF. DESIG	PART NUMBER	DESCRIPTION
B1	13217E0122	MOTOR, COMPRESSOR
B2,3	13217E0026	MOTOR,FAN
C1,2	13217E0023	CAPACITOR
E1	MS 35206-263	PAN HD SCREW
HR1,2	13217E0143	HEATER,THERMAL,208 VAC
	13217E0139-3	HEATER,THERMAL,120 VAC
J1	MS 3102R24-10P	CONNECTOR RECEPTACLE
K1	13217E0056	RELAY,STARTER
K1A	PART OF 13217E0056	COIL,RELAY
S1,6	PART OF 13217E0056	SWITCH, OVERLOAD
S2	13217E0019	SWITCH,ROTARY SELECTOR
S3	13217E0018	SWITCH,TEMPERATURE CONTROL
S4	13217E0096	SWITCH, HIGH PRESS. CUTOUT
TB101	13217E0136-3	TERMINAL BOARD
TB102	13217E0100-5	TERMINAL BOARD
TB103,104	13217E0100-7	TERMINAL BOARD
TB105	13217E0100-2	TERMINAL BOARD

NOTES:

CONVERSION OF THE AIR CONDITIONER FROM 208 VAC TO 120 VAC SHALL BE IN ACCORDANCE WITH THIS WIRING DIAGRAM AND AS LISTED BELOW:

DISCONNECT COMPRESSOR MOTOR LEADS B1-T4, B1-T5 AND B1-T6 FROM TB101-2 AND RECONNECT B1-T4 TO K1-T2, B1-T5 TO K1-T3 AND B1-T6 TO K1-T1.

DISCONNECT WIRE NO. X12A10N FROM TB101-1 AND RECONNECT TO TB101-2.

ADD PART NO. 13217E0025-5, 1 REQUIRED, JUMPER WIRE NO. X11B14C. CONNECT K1-L3 AND TB101-1.

REPLACE PART NO. 13217E0143, 2 REQUIRED, OVERLOAD HEATERS, HR1 AND HR2 WITH PART NO. 13217E0139-3, 2 REQUIRED OVERLOAD HEATERS, HR1 AND HR2.

TS 4120-298-13/1-5

Figure 1-5. Wiring diagram (AC Model ACBM18).

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25C, Operator's Maintenance r
ments for Environmental Equipment, Air Conditioner, 18,000 BTU Floor Mounting.

TECHNICAL MANUAL
No. 5-4120-298-13

HEADQUARTERS
DEPARTMENT OF THE ARM
Washington, D. C., *24 September*

OPERATOR, ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL

AIR CONDITIONER, BASE MOUNTED, AIR COOLED, ELECTRIC MOTOI DRIVEN, 120/208 VOLTS, 3 PHASE, 50/60 CYCLE 5 STACK CONFIGURATION (THERMO KING MODEL S18-104 TM 5) FSN 4120-926-1203 (KECO MODEL F18000-6) FSN 4120-168-2044 (MECOM MODEL 19099-G 18000-5-MEC) FSN 4120-406-3222)

LIST OF ILLUSTRATIONS




CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. These instructions are published for the use of the personnel maintaining the air conditioners (Keco Model F18000-6, Mecom Model 19099-G 18000-5 Mec and Thermo King Model S18-104TM5) as allocated by the Maintenance Allocation Chart. It provides information on operations, organizational and direct support maintenance of the equipment, its accessories, and auxiliaries. The organizational and direct support maintenance repair parts and special tool list are in TM 5-4120-298-23P.

b. Numbers in parenthesis on illustrations indicate the quantity.

1-2. Forms and Records

a. DA Forms and records used for equipme maintenance will be only those prescribed in TM 7 750.

b. Report of errors, omissions and recommen tions for improving this publication by the individu user is encouraged. Reports should be submitted DA Form 2028 (Recommended Changes to Publi tions) and submitted direct to Commanding Gener U. S. Army Mobility Equipment Command, ATT AMSME-MPP, 4300 Goodfellow Boulevard, St. Lou Mo. 63120.

Section II. DESCRIPTION AND DATA

1-3. Description

a. The Keco Model F18000-6, Mecom Model 19099-G 18000-5-Mec and the Thermo King Model S18-104TM5 are electrically powered, air conditioning units of 18,000 BTU/HR capacity. The units consist of five sections (fig. 1-1 thru 1-4) bolted together. The five sections from top to bottom consist of: Evaporator Fan Section, Evaporator Section, Condenser Fan Section, Condenser Section, and Compressor Section.

b. The evaporator fan section houses the evaporator fan motor two evaporator fans, and two evaporator fan housing. The evaporator fan motor drives both evaporator fans. Each fan is enclosed in a housing. The evaporator fan draws air through the filter, over the evaporator coil mounted in the evaporator section, and exhausts it into the conditioned area.

c. The evaporator section houses the evaporator coil and an air filter. Air from the conditioned area, is drawn through the filter and over the coil by evaporator fans mounted in the evaporator fan section. The filter removes foreign matter from the air passing through it. Heat is absorbed from the air passing over the evaporator coil by refrigerant passing through the coil. This action serves to cool the air as it flows through the evaporator.

d. The condenser fan section houses the motor, two condenser fans, two condenser fan housings, a refrigerant sight glass and a refrigerant dehydrator. The condenser fan motor drives both condenser fa One fan is mounted on each end of the through ty armature shaft. Each fan is enclosed in a housi The fans draw ambient air through the compres section, over the condenser coil mounted in the c denser section, and exhaust it to the outside. T sight glass provides an indication of refriger charge when the unit is operating. The refriger dehydrator removes foreign matter from the liq refrigerant passing through it.

e. The condenser section houses the condenser c Ambient air is drawn from the compressor sect into and through the condenser section by the c denser fans mounted in the condenser fan section.

f. The compressor section houses the compres motor, compressor, mechanical clutch, flexible co ling, magnetic starter, and high pressure cut switch. The clutch is attached to the compres motor armature shaft. The flexible coupling attac the clutch output shaft and the compressor sh The compressor motor and compressor are moun on a common support that is attached to the c pressor frame by four shock mounts. The clu serves to reduce starting torque on the compres motor. The high pressure cutout switch stops unit if the compressor discharge pressure ra above 280 psig. Ambient air is drawn into through the compressor section by the conden fans mounted in the condenser section.

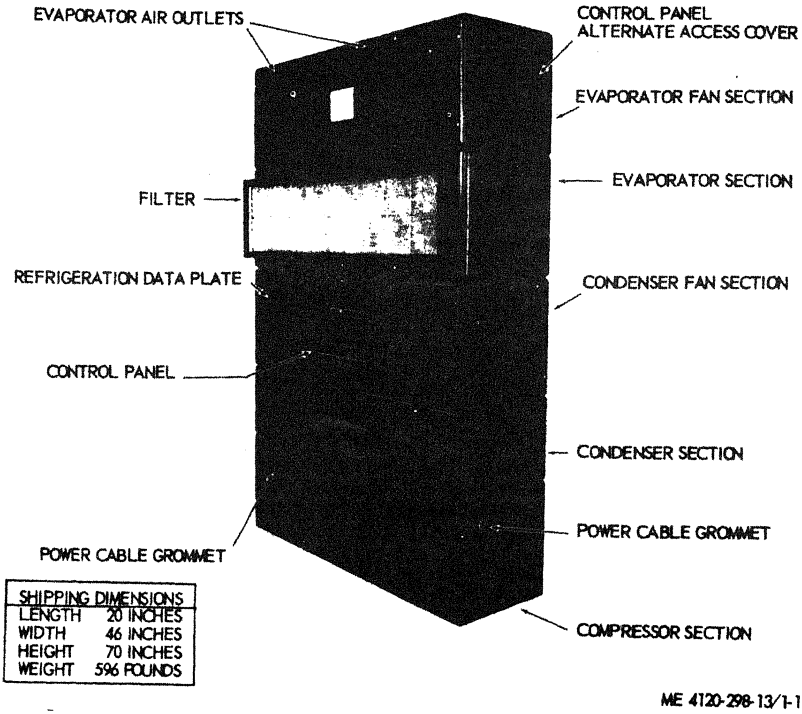


Figure 1-1. Air conditioner, right front, three-quarter view with shipping dimensions.

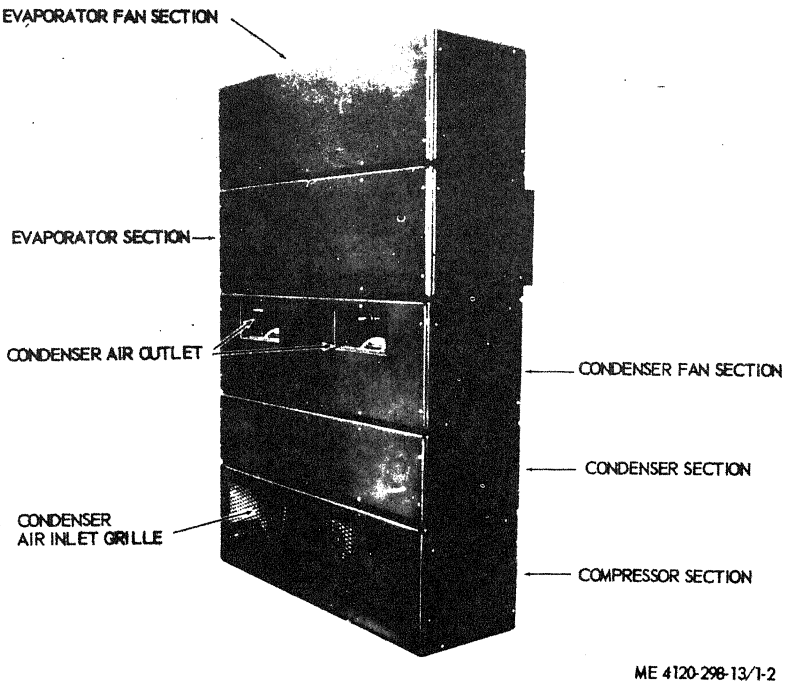


Figure 1-2. Air conditioner, right rear three-quarter view (Thermo King Model S18-104TM5).

rences Between Models.

al covers only the Keco Model F18000-6, del 19099-G18000-5-Mec, and the Thermo el S18-104TM5. No known differences e models covered by this manual.

fication and Tabulated Data

ication. The Keco Model F18000-6, Mecom 9-G18000-5-Mec Model and the Thermo S18-104TM5 each have one major identi- te. The information contained on these ed below.

o Model.

	Keco Industries, Inc.
	F18000-6
	4120-168-2044
	64000-7

om Model.

	Mecom
	19099-G18000-5-Mec (Formerly Keco Model G-18000-5)
	4120-406-3222

rmo King Model.

	Thermo King Corp.
	S18-104TM 5
	4120-926-1203

d Data.

NOTE

g data is identical for both the Keco Model d the Mecom Model 19099-G-18000-5-Mec.

Model and Mecom Model.

conditioner.

	Air cooled
	R12
	18,000 BTU/HR cooling
	3.0 Kilowatts Maximum 120/208 Volts AC (alternating current)
	50/60 CPS (cycles per second)
	Three (4 wire)

pressor motor.

	Louis Allis
	8940324057
	COG4S
	2
	1735/1445 RPM (revolutions per minute)
	6.4 (208V) 11 (120V) (60HZ) 7.25 (208V), 12.5 (120V) (50HZ)
	1.25
	120/208 A.C.
	3
	50/60 HZ
	Clockwise
	R182T with special adapter base
	Drip proof

(c) Fan motors.

Manufacturer	General Electric Co.
Part No.	52060
Type	5KC42JG776T
Horsepower	1/3
Speed	1725 RPM
Service factor	1.35
Voltage	120 Volts A.C.
Phase	1
Frequency	50/60 HZ
Rotation	Evaporator fan motor: Clockwise, Condenser fan motor, Counterclockwise
Frame	56Z
Enclosure	Drip proof

(d) Magnetic starter.

Manufacturer	Keco Industries, Inc.
Part No.	64231
Coil rating	120 Volts A.C.
Frequency	50/60 CPS
Overload Relays	Two (2), Manual Reset Type
Contact Rating	30 Amperes

(3) Overload relay heaters.

Manufacturer	General Electric Co.
Part Number	CR 123-C-13.7-B
Current	Maximum motor amperes 12.8 (at 120 Volts A.C.) Nomenal Trip Amperes 14.7 (at 120 Volts (A.C.)
Part Number	CR 123-C-7.78-A
Current	Maximum Motor Amperes 7.46 (at 208 Volts A.C.) 8.38 (at 208 Volts A.C.)

(f) Main control switch.

Manufacturer	Electro-Switch Corp.
Part Number	52066
Positions	4
Voltage	120 Volts A.C.
Frequency	50/60 CPS

(g) Temperature control.

Manufacturer	Penn Controls, Inc.
Part Number	52069
Type	A19AGC
Voltage	120 Volts A.C.

(h) Compressor.

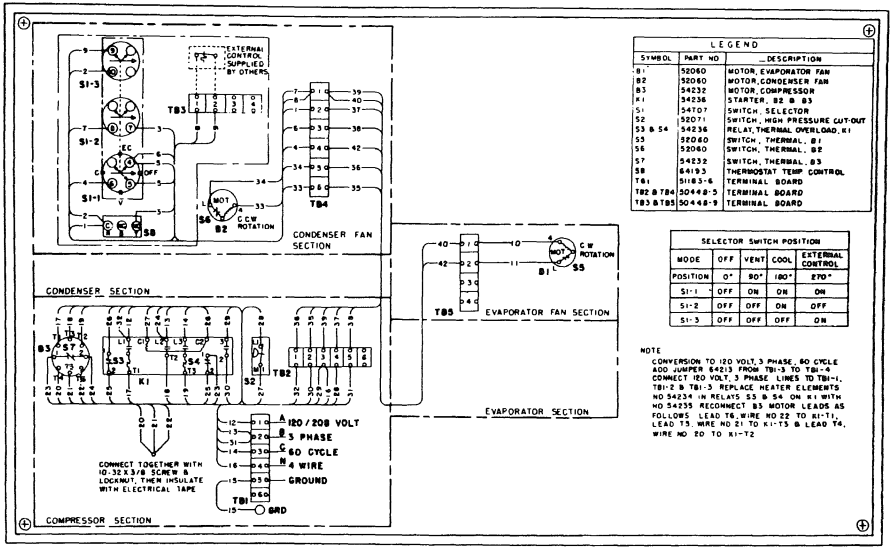
Manufacturer	Thermo King Corp.
Part Number	52070
Model	2S19
Type	Reciprocating 2 cylinder open type

(i) Blower (fan) capacities.

Evaporator Blowers Combined	800 to 1000 CFM (cubic feet per minute) at 0.25 inch water static pressure

(j) Maximum capacity rating conditions.

Ambient	125° F (Degrees Fahrenheit)
Room (or inside)	90° F D.B. (dry bulb) 75° FW.B. (wet bulb)



LEGEND		
SYMBOL	PART NO	DESCRIPTION
B1	52060	MOTOR, EVAPORATOR FAN
B2	52060	MOTOR, CONDENSER FAN
B3	54232	MOTOR, COMPRESSOR
K1	54236	STARTER, B2 & B3
S1	54707	SWITCH, SELECTOR
S2	52071	SWITCH, HIGH PRESSURE CUT-OUT
S3 & S4	54236	RELAY, THERMAL OVERLOAD, K1
S5	52060	SWITCH, THERMAL, B1
S6	52060	SWITCH, THERMAL, B2
S7	54232	SWITCH, THERMAL, B3
S8	64193	THERMOSTAT TEMP CONTROL
TB1	51183-6	TERMINAL BOARD
TB2 & TB4	50448-5	TERMINAL BOARD
TB3 & TB5	50448-9	TERMINAL BOARD

SELECTOR SWITCH POSITION				
MODE	OFF	VENT	COOL	EXTERNAL CONTROL
POSITION	0°	90°	180°	270°
S1-1	OFF	ON	ON	ON
S1-2	OFF	OFF	ON	OFF
S1-3	OFF	OFF	OFF	ON

NOTE

CONVERSION TO 120 VOLT, 3 PHASE, 60 CYCLE
ADD JUMPER 64213 FROM TB1-3 TO TB1-4
CONNECT 120 VOLT, 3 PHASE LINES TO TB1-1, TB1-2 & TB1-3. REPLACE HEATER ELEMENTS NO 54234 IN RELAYS S3 & S4 ON K1 WITH NO 54235. RECONNECT B3 MOTOR LEADS AS FOLLOWS: LEAD T6, WIRE NO 22 TO K1-T1, LEAD T5, WIRE NO 21 TO K1-T3 & LEAD T4, WIRE NO 20 TO K1-T2

(k) Maximum operating temperatures.

Ambient	125°F
Room (or inside)	120°F

(l) Dimensions and weight.

Depth	14 in. (inches)
Width	42 in.
Height	65 5/16 in.
Weight	475 lb. (pounds)
Cube	37.5 (level "C")

(m) Wiring Diagram. See figure 1-3

(2) Thermo King Model.

(a) Air conditioner.

Manufacturer	Thermo King Corp.
Model	S18-104TM5
Type	Air Cooled
Refrigerant	R12
Capacity	18,000 BTU/HR Cooling

(b) Compressor motor.

Manufacturer	Thermo King Corp.
Part Number	2039B78G01
Frame and Inclosure	AVO-213-Drip Proof
Horsepower	2
Speed	1800 RPM
Voltage	120/208
Phase	3
Frequency	50/60 HZ
Rotation	Clockwise
Insulation	Type B
Temperature Rise	40 — 50° C (Centigrade)
Bearings	Grease-sealed, Ball

(c) Fan motors.

Manufacturer	Thermo King Corp.
Part No.	S18-460-3
Frame and Inclosure	D56Z-Drip Proof
Horsepower	1/3
Speed	1725/1425 RPM
Voltage	115
Phase	1
Frequency	50/60 CPS
Rotation	Clockwise
Insulation	Type B
Temperature Rise	40/50° C
Bearings	Grease-sealed, Ball

(d) Magnetic starter.

Manufacturer	Thermo King Corp.
Part Number	2116B60G02
Coil Rating	120 Volt
Phase	3
Frequency	60 CPS
Quantity of Overload Heaters	2

(e) Overload relay heaters.

Manufacturer	Arrow, Hart and Gegeman Electric Company
Part No.	208 V 42016 120V 42021

(f) Power source fuse size.

208V	20 Ampere
120V	30 Ampere

(g) Main control switch.

Manufacturer	Thermo King Corp.
Part Number	S18-401
Number of positions	4

(h) Temperature control switch.

Manufacturer	Thermo King Corp.
Part Number	S18-423

(i) Power requirements.

Kilowatts (KW)	3.2

(j) Blower (fan) capacities.

Evaporator Blowers combined	900 CFM
Condenser Blowers combined	1,200 CFM

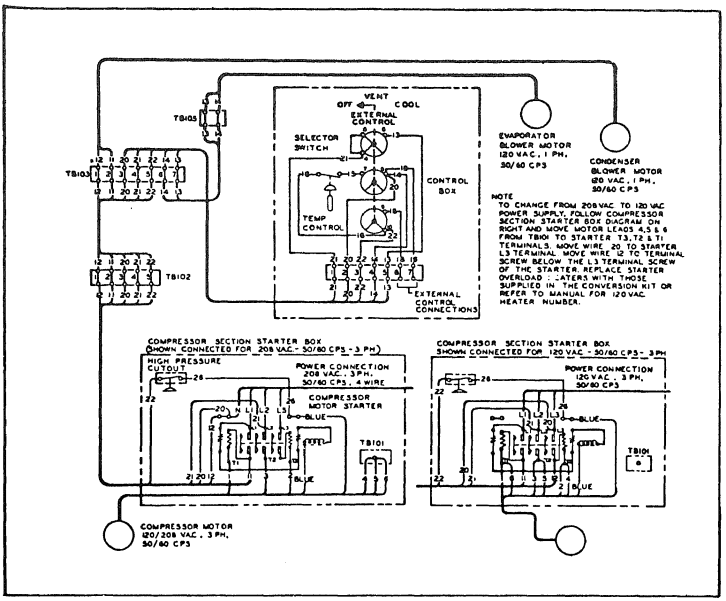
(k) Ambient conditions for operation at capacity.

Dry Bulb Temperature	
Sea Level	125°F
5000 ft (foot or feet) elevation	107°F
Wet Bulb Temperature	
Sea Level	85°F
5000 ft elevation	85°F

(l) Dimension and weight.

Depth	14 in.
Width	42 in.
Height	65¼
Weight	512 lb
Cube	37.5 (Level "C")

(m) Wiring diagram. See figure 1-4.



ME 4120-298-13/1-4

Figure 1-4. Wiring diagram (Thermo-King Model S18-104TM5).

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIAL

2-1. Inspection and Servicing the Equipment

WARNING

When testing for refrigerant leaks, with a halide torch, be sure the area is well ventilated. When the torch comes in contact with the refrigerant, phosgene gas is formed. Phosgene gas has the odor of new mown hay and can be deadly.

a. Inspection. Remove the front, rear and end panels from all sections (fig. 3-1) and inspect for physical damage to the air conditioner components and oil leakage from the compressor. Use a halide detector torch over the entire unit to inspect for refrigerant leakage. Manually turn the fans, compressor and motors to see that they turn freely.

b. Preventive Maintenance Checks and Services. Refer to paragraph 3-5 and perform the daily preventive maintenance checks and services.

2-2. Installation

a. Location. The air conditioning unit should be mounted level and in proper alignment with the shelter wall. The evaporator air outlet and return should not be restricted by equipment within the shelter. The condenser air blower should not be restricted by grills or covers. Adequate space should be provided at the front and sides of the unit for the removal of panels in service or maintena dures.

b. Installation.

(1) Position the unit on the shelter wal ment of duct openings, secure the unit to t drilling holes in the back cover in alignmer holes in the corners of the frame and i inch bolts of the proper length.

(2) Connect a power source cable of 3 phase, 50/60 cycle to the terminal board 1-3) in the compressor section for the K F18000-6, and Mecom Model 19099-G1800 to the magnetic contactor (fig. 1-4) in the c section for the Thermo King Model S18-104

(3) Refer to figure 2-1 and insure tha pressor suction service valve, discharge ser condenser shutoff valve, dehydrator out valve, receiver out shutoff valve and the s shutoff valve are in the open position.

CAUTION

Turn discharge service valve one tu of back seat to insure pressure s operation.

(4) The unit is shipped wired for 208 vo 50/60 Hertz power. The unit may be cor 120 volt, 3 phase, 50/60 Hertz power by ch heater elements, adding a jumper, and re certain leads (fig. 1-3 and 1-4).

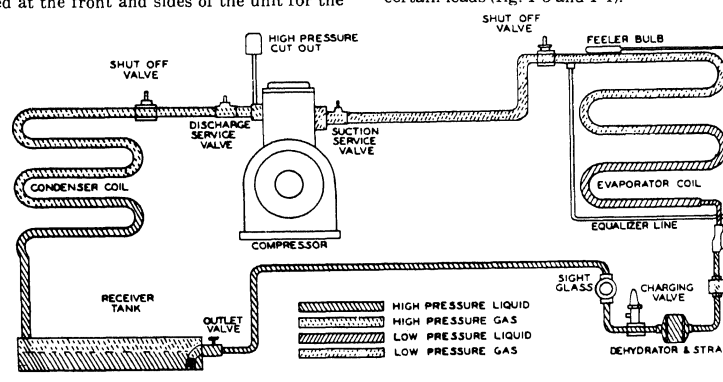


Figure 2-1. Valves.

Section II. MOVEMENT TO A NEW WORKSITE

2-3. Dismantling for Movement

a. Limited Movement. For movement to a short distance involving limited handling, it is necessary only to detach the air conditioner from the shelter and disconnect the power source cable.

b. Extensive Movement. Pump down refrigerant (para 5-8). Close all valves (fig. 2-1). Detach the air conditioner from the shelter and disconnect the power source cable. Seal all openings in the cabinet with barrier material and sealing tape. Cover the entire cabinet with a protective barrier material.

2-4. Reinstallation After Movement

Refer to paragraph 2-2 for installation instructions.

Section III. CONTROLS AND INSTRUMENTS

2-5. General

This section describes, locates, illustrates, and furnishes the operator/crew sufficient information about the various controls and instruments for proper operation of the air conditioner.

2-6. Controls and Instruments

The purpose of the controls and instruments and their normal maximum readings are illustrated in figure 2-3.

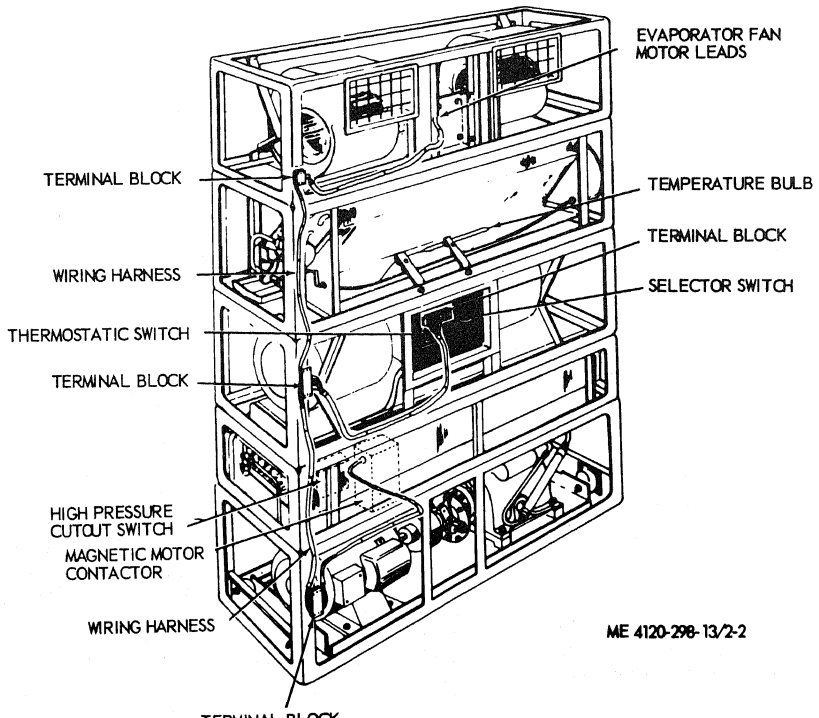


Figure 2-2. Controls and instruments.

Section IV. OPERATION UNDER USUAL CONDITIONS

2-7. General

a. The instructions in this section are published for the information and guidance of the personnel responsible for the operation of the air conditioner.

b. The operator must know how to perform every operation of which the air conditioner is capable. This section gives instructions on starting, stopping the air conditioner, basic motions of the air conditioner, and on coordinating basic motions to perform specific task for which the equipment is designed. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

2-8. Starting

a. Preparation for Starting.

(1) Refer to paragraph 2-2 to insure the air conditioner is properly installed.

(2) Refer to paragraph 3-5 and perform the daily preventive maintenance checks and services.

b. Starting.

(1) The manual thermostat, and selector switch are mounted on the control panel (fig. 2-3).

(2) Refer to figure 2-3 and start the air conditioner.

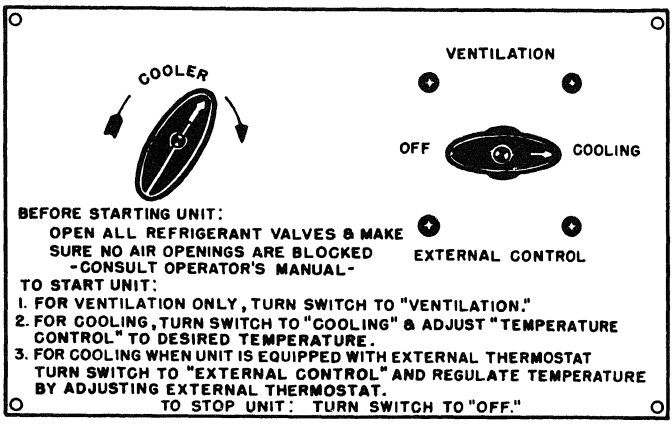


Figure 2-3. Starting and stopping instructions. ME 4120-298-13/2-3

NOTE

In the case of malfunction refer to chapter 3 section IV (troubleshooting) for probable cause and possible remedy.

2-9. Stopping

a. Refer to figure 2-3 and turn the selector switch knob to the off position.

b. Refer to paragraph 3-4 and perform the after operation Preventive Maintenance checks and services.

2-10. Operation of Equipment

a. General.

(1) The air conditioner is normally used for mechanically cooling the control space automatically. It may be used to ventilate only. Care should be taken to insure that doors to the conditioned space close with a good seal against the ambient air. Frequent door opening will impose an abnormal load on the air conditioning unit, preventing normal on and off cycles.

(2) The operator must be observant at all times particularly concerning unusual sounds that would indicate malfunctions of the air conditioner. When unusual sounds occur, stop operation and report to organizational maintenance.

b. Operation.

(1) Refer to paragraph 2-8 and start the air conditioner.

(2) The coolest setting of the thermostat should correspond to a temperature of approximately 60° in the conditioned air space. After several hours operation at this setting the thermostat may be set back from extreme cooling position to attain whatever temperature above 60° F is desired in the conditioned air space.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

2-11. Operation in Extreme Cold

a. The air conditioner is designed to operate on cooling cycle without forming frost or ice on the evaporator coil at an ambient temperature as low as 60° F with air at plus 75° F dry bulb and plus 63° wet bulb entering the evaporator.

b. If cooling air is desired at lower ambient temperatures, set the selector switch knob (fig. 2-3) to the ventilation position to operate the blower only.

2-12. Operation in Extreme Heat

a. Extreme heat imposes an unusual load on the unit. The air conditioner must not be started or operated at ambient temperatures in excess of 125° F or air entering the evaporator in excess of 120° F.

b. Extra precautions must be taken to assure that the condenser air flow is not hampered by obstruction on the inlet grill. The condenser coil must be kept clean.

c. Excessive ambient heat can cause the high pressure cut-out switch or the thermo overload switch to trip during the initial pulldown. To reset these cut-outs push the reset buttons (fig. 2-2) located on the compressor section.

NOTE

A few minutes should be allowed to elapse before pushing reset buttons.

2-13. Operation In Dusty or Sandy Areas

a. In very dusty or sandy areas care must be taken to keep the air filters evaporator and condenser coil fins free of matter which will restrict air circulation

b. Filters and fins should be inspected every four hours and cleaned when clogging is in evidence.

2-14. Operation Under Rainy or Humid Conditions

The air conditioner control panel must be protected to prevent direct contact with rain.

2-15. Operation in Salt Water Areas

a. Exposure to salt water and air may cause corrosion of exposed bare metal surfaces.

b. Wash down the exterior of the unit with clean fresh water at frequent intervals. Take care not to damage electrical components with water.

c. Inspect the unit daily and clean the evaporator and condenser coils and air filters as frequently as required to maintain proper operation.

2-16. Operation at High Altitudes

Altitude up to 5,000 feet will have no appreciable effect on the air conditioner. Above 5,000 feet performance will drop off slightly below the normal rating of 18,000 BTU/HR of which the unit is capable.

CHAPTER 3
OPERATOR'S MAINTENANCE INSTRUCTIONS

Section I. BASIC ISSUE ITEMS

3-1. General

Tools, equipment, and repair parts issued with or authorized for the air conditioner are listed in the basic issue items list, appendix C.

3-2. Special Tools

No special tools are required to perform operator crew maintenance on the air conditioner.

Section II. LUBRICATION INSTRUCTIONS

3-3. General Lubrication Information

Motors and other components of the air conditioner covered by this manual are lubricated for life and requires no further lubrication. Oil should be visibl in the compressor oil sight glass at all times.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-4. General

To insure that the air conditioner is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in paragraph 3-5. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the air conditioner will be noted for future corrections, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which woul damage the equipment if operation were continued All deficiencies and shortcomings will be recorde together with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

3-5. Preventive Maintenance Checks and Services

Table 3-1 contains a listing of the minimum inspec tion requirement for operators preventive mainte nance checks and services. This table indicates, b an X in the appropriate column (before, during, after weekly,) when the inspection should be performed.

Section IV. TROUBLESHOOTING

3-6. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the air conditioner, or any of its components. Each malfunction is followed by a list of probable causes of the trouble. The corrective action recommended is described opposite the probable cause. Any trouble beyond the scope of operators mainte nance shall be reported to organizational mainte nance.

3-7. Operator/Crew Maintenance Troubleshooting

Refer to table 3-2 for operator/crew troubleshooting.

Section V. MAINTENANCE OF HOUSING GRILLS AND PANELS

3-8. General

The entire air conditioning unit is enclosed in single unit frames with removable panels and access doors. Operator/crew maintenance is limited to repair or replacement of the grill assembly, and repair or replacement of the panel assemblies except for the panel between the condenser fan and evaporat section.

3-9. Housing Grills and Panels

a. Removal. Remove the housing grills and pane (fig. 3-1) by turning the fasteners (29) $\frac{1}{4}$ turn counte clockwise.

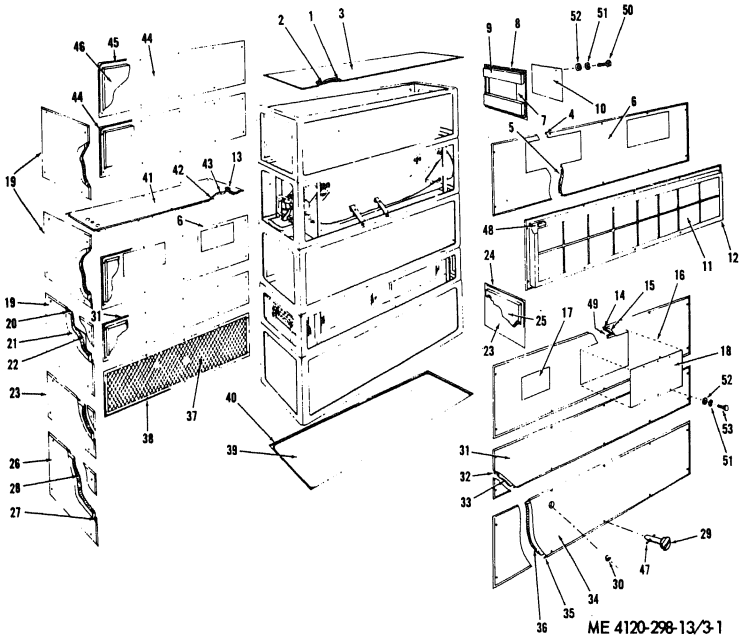
Table 3-1. Preventive Maintenance Checks and Services

B – Before operation
D – During operation
A – After operation
W – Weekly
M – Monthly
Q – Quarterly

Item number	Interval: Operator: Daily: B	D	A	W	Org.: M	Q	Item to be inspected	Procedure	Reference
1	X						Air Conditioner	Visually inspect entire unit for cracks, breaks, and loose or missing hardware.	Para 3-9
2	X						Condenser and Evaporator Coils	Check coil fins for dust or foreign matter. Check all tubing connections for signs of leaking or other defects. Report leak or defect to direct support maintenance.	Para 3-13 and 3-14
3	X						Selector Switch	Check for proper operation and inspect for loose electrical connections. Report defects to organizational maintenance.	
4	X	X					Compressor Sight Glass	Check oil level as indicated by sight glass. Report low oil level to direct support maintenance.	Para 3-11
5		X					Thermostat	Assure that thermostat is maintaining desired temperature. Report defect to organizational maintenance.	
6	X						Refrigerant System	Assure that refrigerant hose and tubing is free of leakage abrasion, tearing, kinking, etc. Report all defects to direct support maintenance.	
7	X						Air Filter	Inspect for cleanliness. Clean or replace.	Para 3-10
8	X						Wiring	Check for loose or damaged wiring. Report defect to organizational maintenance.	
9		X					Refrigerant Sight Glass	Check for bubbling of fogging. Report to direct support maintenance when condition exists.	Para 3-12
10		X					Fans	Check evaporator and condenser fans for binding. Report binding to organizational maintenance.	Para 4-26
11				X			Compressor	Inspect for leaks, damage and insecure mounting. Report defect to direct support maintenance.	
12		X					General Maintenance	Be alert for unusual noises or improper operation.	

Table 3-2. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Air conditioner fails to start	*a.* Controls not properly set *b.* Power supply leads loose	*a.* Set controls for starting (para 2-8). *b.* Tighten leads. (para 2-2).
2. Air conditioner noisy during operation	Panels loose	Tighten fasteners. Replace defective fasteners (para 3-9).
3. Insufficient cooling	*a.* Thermostat switch improperly set	*a.* Set thermostat switch for cooler operation (fig. 2-3).
	b. Service or shutoff valves not open	*b.* Open refrigerant valves (para 2-2).
4. No cool air discharge	*a.* Selector switch in wrong position *b.* Thermostat switch improperly set *c.* Filter dirty *d.* High pressure cutout switch tripped. *e.* Thermal overload switch tripped.	*a.* Set selector switch for cooling (fig. 2-3). *b.* Set thermostat switch for cooling (fig. 2-3). *c.* Clean filter (para 3-10). *d.* Reset high pressure cutout switch (fig. 2-2). *e.* Allow motor to cool and reset itself.
5. Excessive cooling	Thermostat switch set for too cool operation	Set thermostat for desired temperature (fig. 2-3).



1 Sealing strip
2 Insulation
3 Panel, top
4 Sealing strip
5 Insulation
6 Panel side
7 Panel, end
8 Sealing strip
9 Insulation
10 Cover
11 Filter
12 Frame, filter
13 Grommet
14 Sealing strip
15 Insulation
16 Panel, side
17 Refrigeration diagram
18 Cover
19 Panel end
20 Sealing strip
21 Insulation
22 Plate, instruction
23 Plate, end
24 Sealing strip
25 Insulation
26 Plate, end
27 Sealing strip
28 Insulation
29 Fastener
30 Grommet
31 Panel, side
32 Sealing strip
33 Insulation
34 Panel
35 Sealing strip
36 Insulation
37 Panel rear-compressor section
38 Sealing strip
39 Panel, bottom
40 Seal strip
41 Panel
42 Sealing strip
43 Insulation
44 Panel, side
45 Sealing strip
46 Insulation
47 Pin turnlock stud
48 Strip, sealing
49 Strip, sealing
50 Screw
51 Washer, lock
52 Washer, flat
53 Screw

Figure 3-1. Frame and panel assembly.

b. Cleaning, Inspection and Repair.

(1) Clean all parts and dry thoroughly.

(2) Inspect the grills for dents or other damage. Inspect the fasteners and receptacles. Replace defective fasteners (fig. 3-2). Inspect the gaskets (fig. 3-1) for wear. Replace defective gaskets. New gaske are installed by removing the strip fro the gask adhesive backing and pressing the gasket in plac Inspect the insulation for security and conditio Glue loose insulation, or new insulation to the pane with cement.

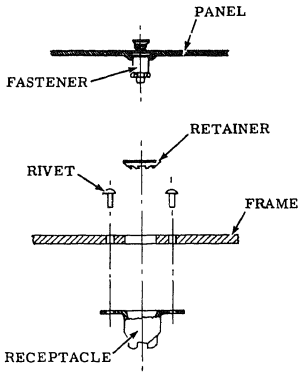


Figure 3-2. Panel fasteners and receptacle installation

c. Installation. Refer to figure 3-1 and replace the housing grills and panels. Place panels in position and turn fasteners ¼ turn clockwise.

Section VI. MAINTENANCE OF AIR FILTER AND SIGHT GLASSES

3-10. Air Filter

Refer to figure 3-3 and service the air filter.

3-11. Compressor

Operator's maintenance of the compressor consists of checking the oil level through the compressor sight glass. The oil level should be midpoint in the sight glass.

3-12. Refrigerant System

Operator's maintenance of the refrigerant system consists of checking the refrigerant through the refrigerant sight glass. The refrigerant should appear as a clear blue liquid. (Check color code on sight glass cap). If bubbling, fogging, or a pink color appears, report the condition to Direct Support Maintenance.

Section VII. MAINTENANCE OF CONDENSER AND EVAPORATOR

3-13. Condenser

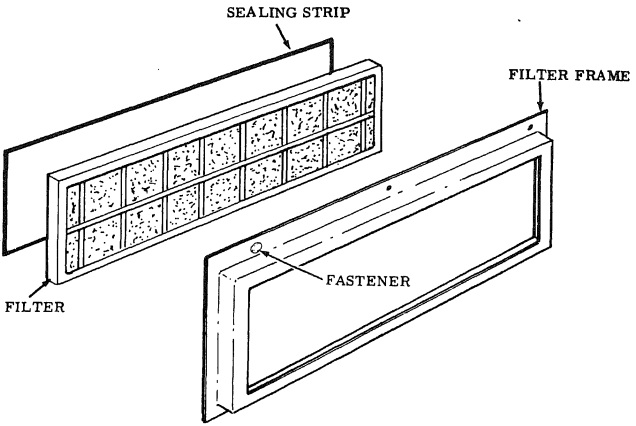
a. General. Operators maintenance on the condenser is limited to cleaning.

b. Cleaning. Clean outside area with water and dry with compressed air.

3-14. Evaporator

a. General. Operators maintenance on the evaporator is limited to cleaning.

b. Cleaning. Clean outside area with water and dry with compressed air.



CLEANING AIR FILTER

1. REMOVE FILTER FRAME ASSEMBLY BY LOOSENING SIX FASTENERS.
2. TAKE OUT FILTER.
3. CLEAN FILTER WITH APPROVED CLEANING SOLVENT (FEDERAL SPECIFICATION PD 680 OR EQUAL). BLOW FILTER DRY WITH LOW PRESSURE COMPRESSED AIR. REPLACE A DAMAGED FILTER. DIP OR SPRAY FILTER WITH MIL-L-2104 GRADE 30 OIL. DRAIN OFF OIL BEFORE INSTALLATION.
4. REPLACE FILTER.
5. REINSTALL FILTER FRAME ASSEMBLY.

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Figure 3-3. Air filter service.

CHAPTER 4
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

4-1. Inspecting and Servicing the Equipment

Instructions for inspecting and servicing the equipment are described in paragraph 2-1.

4-2. Installation

Organizational maintenance personnel will assi operator in installing the air conditioner as describe in paragraph 2-2.

Section II. MOVEMENT TO A NEW WORKSITE

4-3. General

Movement to a new worksite is described in paragraph 2-3. Organizational maintenance personnel will assist the operator in preparing equipment for administrative storage.

Section III. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

4-4. Tools and Equipment

Tools equipment and repair parts issued with or authorized for the air conditioner are listed in the basic issue items lists, appendix C.

4-5. Special Tools and Equipments

No special tools or equipments is required to perform organizational maintenance on the air conditioner.

4-6. Maintenance Repair Parts

Repair parts and equipment required for organiz tional maintenance of the air conditioner are liste and illustrated in TM 5-1420-298-23P.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-7. General

To insure that the air conditioner is ready for operation at all times, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services to be performed are listed and described in paragraph 4-8. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation will be reported to organizational maintenance as soon as operation has ceased. Operation will be stopped immediately when a deficiency is noted during operation which would damage the equipment if operation were continued (para 3-4). All deficiencies and shortcomings reported will be recorded together with the corrective action take on DA Form 2404 (Equipment Inspection and Mai tenance Worksheet) at the earliest opportunity.

4-8. Preventive Maintenance Checks and Services

Table 4-1 contains a listing of the minimum inspe tion requirements for organizational preventi maintenance checks and services. This table inc cates, by an X in the appropriate column, monthly quarterly) when the inspection should be performe A quarterly interval for the air conditioner is equ to three months, or 1,800 hours of operation, whic ever occurs first.

Table 4-1. Preventive Maintenance Checks and Services

B – Before operation D – During operation | A – After operation W – Weekly | M – Monthly Q – Quarterly

Item number	Interval						Item to be inspected	Procedure	Reference
	Operator				Org.				
	Daily								
	B	D	A	W	M	Q			
1				X		X	Air Conditioner	Visually inspect entire unit for cracks, breaks, and loose or missing hardware.	Para 3-9
2				X		X	Condenser and Evaporator Coils	Check coils for dust or foreign matter. Check all tubing connections for signs of leaking or other defects. Report leaks or defects to direct support maintenance.	Para 3-13 and 3-14
3				X		X	Selector Switch	Check for proper operation and inspect for loose electrical connections. Replace defective switch.	Para 4-19
4				X		X	Compressor Sight Glass	Check oil level as indicated by sight glass. Report low oil level to direct support maintenance.	Para 3-11
5				X		X	Thermostat	Assure thermostat is maintaining desired temperature. Replace a defective thermostat.	Para 4-20
6				X		X	Refrigerant System	Assure that refrigerant hose and tubing is free of leakage, abrasion, tearing, kinking, etc. Report all defects to direct support maintenance.	
7				X		X	Wiring	Check for loose or damaged wiring.	
8				X		X	Refrigerant Sight Glass	Check for bubbling or fogging. Report to direct support maintenance when condition exist.	Para 3-12
9				X		X	Fans	Check evaporator and condenser fans for binding. Adjust fans if necessary.	Para 4-24
10							Compressor	Check for leaks, damage and insecure mounting. Report defects to direct support maintenance.	
11				X		X	Electric Motors	Inspect for improper operation and loose mounting. Inspect for loose electrical connections. Replace a defective motor.	Para 4-24

Section V. TROUBLESHOOTING

4-9. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the air conditioning unit and its components. Each malfunction listed is followed by a list of probable causes of the trouble. The corrective action recommended is described opposite the probable cause. Any trouble beyond the scope of organizational maintenance shall be reported to direct support maintenance.

4-10. Organizational Troubleshooting

Refer to table 4-2 for organizational troubleshooting.

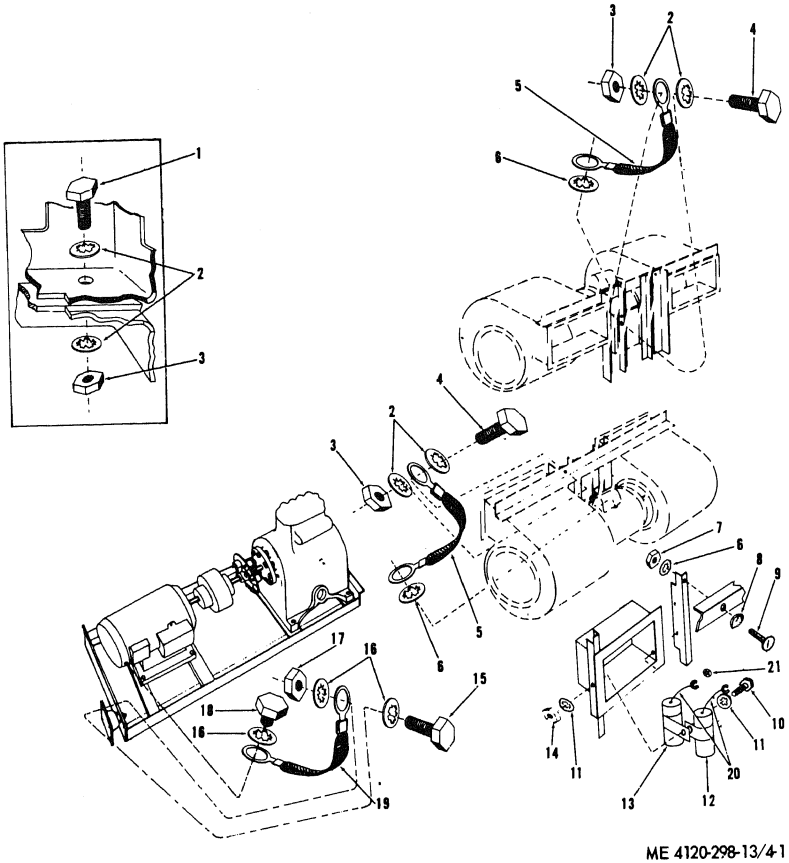
Table 4-2. Organizational Troubleshooting

Malfunction	Probable cause	Corrective action
1. Air conditioner fails to start	Defective selector switch	Check selector switch. Replace defective switch (para 4-19).
2. Air conditioner noisy during operation	*a.* Evaporator and/or condenser fans rubbing rubbing housing	*a.* Realign fan and/or motor (para 4-26).
	b. Worn or defective clutch	*b.* Replace clutch (para 4-25).
	c. Loose or defective coupling	*c.* Tighten or replace coupling (para 4-25).
3. No cool air discharge	*a.* Compressor motor starter overload tripped	*a.* Reset starter overload. Determine cause overload and correct.
	b. Defective starter circuit or starter	*b.* Check starter circuit (fig. 1-5 and 1-6). Repair or replace starter (para 4-18).
	c. Compressor and/or condenser motor stopped due to tripped thermoswitch	*c.* Allow motor to cool and reset itself. (para 4-23). Determine cause of overlo correct.
	d. Defective thermostat switch circuit or thermostat switch	*d.* Check thermostat circuit (fig. 1-3 and 1- Replace thermostat switch (para 4-20)
4. No air output from outlet ducts	*a.* Evaporator fan motor stopped due to tripped thermoswitch	*a.* Allow motor to cool and reset itself (pa 4-23).
	b. Evaporator fans loose on motor shafts	*b.* Tighten setscrew attaching fans on shaf (para 4-26).
	c. Evaporator fan jammed against housing	*c.* Realign fan and/or motor (para 4-26).
	d. Evaporator fan motor bearing seized	*d.* Replace motor (para 4-26).
5. Excessive cooling	Defective thermostat switch circuit or thermostat switch	Check thermostat circuit (fig. 1-3 and 1 Replace defective thermostat (para 4-2
6. Compressor motor and condenser motor stops, but evaporator motor continues to run	*a.* Clogged condenser fan	*a.* Clean condenser fan.
	b. Discharge service valve not properly opened	*b.* Fully open discharge service valve and t frontseat it one-half turn.
	c. Condenser fan loose on shaft	*c.* Realign fans and/or motor (para 4-24).
	d. Condenser fan motor inoperative	*d.* Replace condenser fan motor.
	e. Compressor motor defective or overloaded	*e.* Replace defective compressor motor (para 4-23).
7. Compressor short cycles	Overheated compressor motor	Allow motor to cool and reset itself (para 4-23). Determine cause of overl and correct.

Section VI. RADIO INTERFERENCE SUPPRESSION

4-11. General Methods Used To Attain Proper Suppression

Essentially, suppression is attained by providing a low resistance path to ground for the stray currents. The methods used include grounding straps for electric motors, star washers grounding section frame assemblies, and capacitors of 0.1 mfd (12 and 13, fig. 4-1) in the control box.



1 Screw
2 Lockwasher
3 Nut
4 Screw
5 Strap, ground
6 Lockwasher
7 Nut
8 Lockwasher
9 Screw
10 Screw
11 Lockwasher
12 Capacitor
13 Capacitor
14 Nut
15 Screw
16 Lockwasher
17 Nut
18 Nut
19 Strap, ground
20 Wire assembly
21 Lockwasher

Figure 4-1. Radio suppression components.

4-12. Interference Suppression Components

Refer to figure 4-1 for identification and location of suppression components.

4-13. Replacement of Suppression Components

Refer to figure 4-1 to replace suppression components.

4-14. Testing of Radio Interference Suppression Components

Test the capacitor for leaking or shorting with capacitor tester and replace the capacitor if defecti If test equipment is not available and interference indicated, use trial and error method by substituti a replacement capacitor.

Section VII. HOUSING ASSEMBLY FRAME

4-15. General

The entire air conditioning unit is enclosed in single unit frames with removable panels. Organizational maintenance is limited to replacement of support channels on the frame (fig. 3-1).

4-16. Housing Frames

a. Removal. Refer to paragraph 3-9 and remove the housing grills and panels.

b. Cleaning and Inspection.

(1) Clean all parts and dry thoroughly.

(2) Inspect for dents or other damage. Repla defective parts.

c. Installation. Refer to paragraph 3-9 and repla housing grills and panels.

Section VIII. CONTROLS AND INSTRUMENTS

4-17. Control Panel

WARNING

High voltage is on components in control box. Disconnect power leads before removing control panel.

a. General. Organizational Maintenance may replace or repair the control panel as necessary (fig. 4-2 and 4-3).

b. Inspection. Visually inspect the control panel for dents or other damage. Replace the selector switch (para 4-19) and thermostat (para 4-20) if defective. Tag wires for identification.

c. Removal. Turn main control switch (fig. 4-3) to OFF position and turn off main power breaker. Turn studs holding panel to enclosure. Remove Allen screw holding the temperature control knob to its shaft. Remove the screws holding the selector switch to control panel and remove control panel.

d. Installation. Secure main control switch to the control panel with four mounting screws. Fasten the control panel to the enclosure with the six ¼ turn studs. Place the thermostat knob on its shaft and secure it with the Allen screw.

4-18. Master or Auxiliary Control Assembly

WARNING

Be cautious of high voltage in starter box.

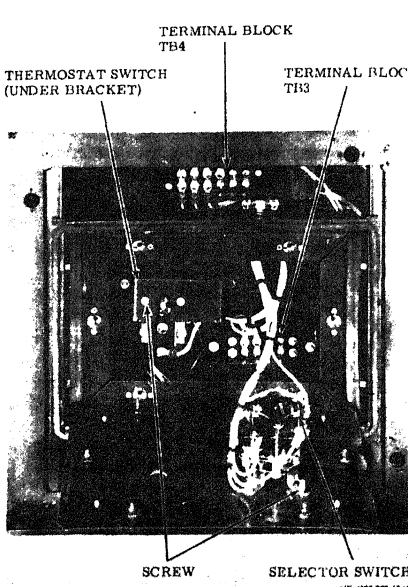


Figure 4-2. Control panel removed.

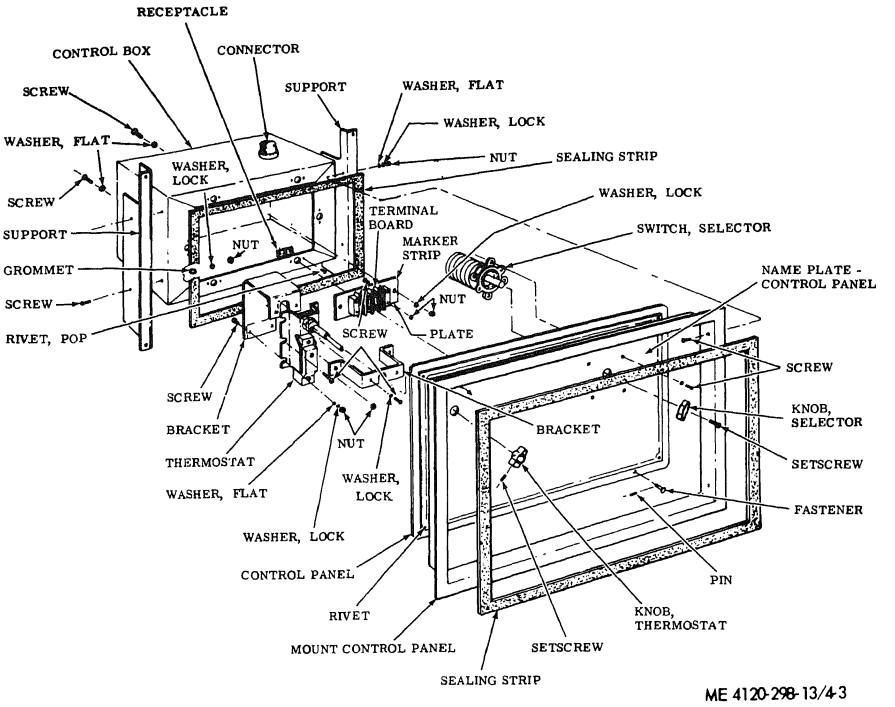


Figure 4-3. Control panel, exploded view.

a. General. The compressor and condenser fan motors are started and stopped by the opening and closing of a magnetic starter (fig. 4-4) which controls the power circuit on demand from the control circuit. Organizational maintenance may repair or replace any or all components in this assembly. The control circuit from the thermostat is connected to the contactor magnetic coil (fig. 1-3 and 1-4). When the temperature control switch closes, the current flow in the magnetic coil causes the armature to pull down and the points close to complete the circuit to the compressor motor and the condenser fan. When the temperature demand in the space being cooled has been satisfied the temperature control switch opens and breaks the circuit to the magnetic coil causing the points to open which terminates power to the motors. When excessive current passes through the starter heater, its thermostatic switch opens, cutting the current to the motors. The automatic thermal overload switches in the evaporator and condenser fan motors and in the compressor motor will reset themselves, after a short period of time elapses. The compressor motor overload heater (7, fig. 4-4) must be reset manually by pushing the reset button after correcting the cause of the overload condition.

b. Removal. Contactor (fig. 4-5) may be removed without removing the entire assembly by loosening the respective cover mounting, screws, spring retainers and lifting out the contactor (5, fig. 4-4). To remove the contactor, disconnect and tag all leads from the terminals. Remove the contactor mounting screws (1) and lift the contactor (5) from its housing (4). Remove the screws (6) to lift out the heater (7) and replace it.

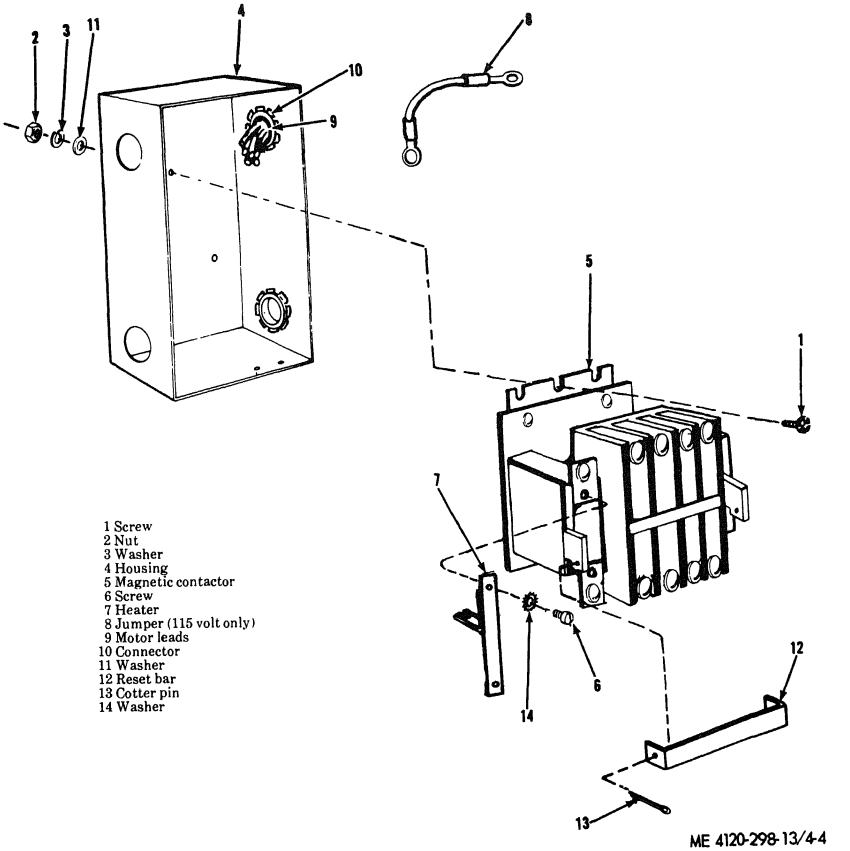


Figure 4-4. Magnetic starter.

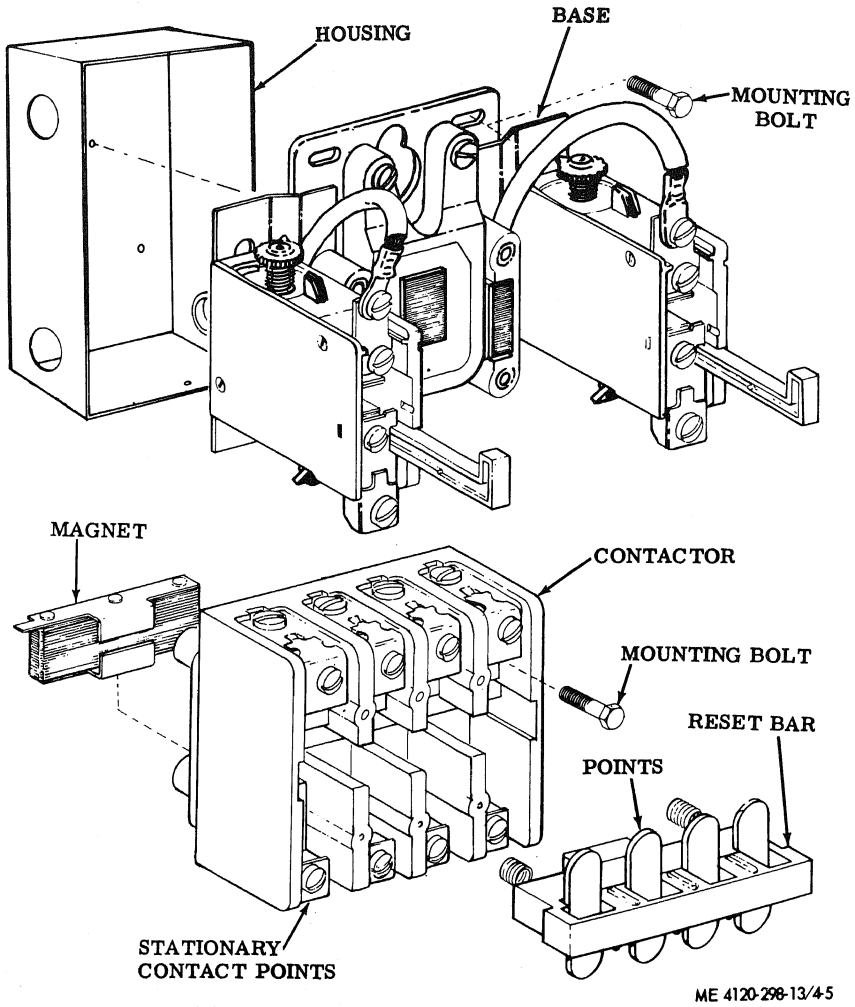


Figure 4-5. Contactor points removed.

c. Cleaning and Inspection. Inspect the contactor for pitted points and evidence of arcing or excessive heating. Clean with an approved solvent and dry with compressed air. Replace defective parts.

d. Installation. To install the contactor, place it in position in its housing and tighten the mounting bolts. Reconnect all leads to proper terminals.

4-19. Selector Switch

a. General. Organizational maintenance may inspect, test and replace the selector switch (fig. 4-2) as required. Access to the switch terminals is gained by removing the control panel (para 4-17).

b. Inspection and Testing. Check the switch for freedom of rotation by rotating it 360 . Check that the leads are properly attached to the terminals. Check the continuity through the switch with a circuit tester. If the switch is defective, it must be replaced.

c. Removal. Disconnect and tag the leads from the terminals. Loosen the setscrew attaching the selector switch knob to the selector switch shaft (fig. 4-3). Remove the four screws attaching the switch to the control panel.

d. Installation. Assemble the switch to the control panel with the four screws. Place the knob on the shaft and install the setscrew connect the leads to the terminals. Reinstall the control panel (para 4-17).

4-20. Thermostat Switch

a. General. Organizational maintenance may remove and replace the thermostat switch. The thermostat switch must be replaced if it is defective. The thermostat switch is a temperature control which operates in response to its temperature sensitive bulb mounted in the evaporator section. Access to the switch is gained by removing the control panel (para 4-17).

b. Removal.

(1) Refer to figures 4-2 and 4-3 and remove a tag all leads from the terminals.

(2) Loosen the setscrew attaching the thermost knob. Remove the screws attaching the bracket a switch, and separate the switch from the bracket.

(3) Refer to figure 5-3 and loosen the screws (3 holding the thermostat bulb clamp (30) to the ev porator frame bracket and slide the bulb out. Pu the tubing and bulb through the bulkhead and remo from unit.

c. Installation.

(1) Thread the temperature sensitive bulb a tubing through the bulkhead and secure it to t evaporator with the clamp provided (fig. 5-3).

(2) Refer to figure 4-3 and assemble the therm stat and mounting bracket.

(3) Attach the thermostat and bracket to t control box with the screws.

(4) Refer to figure 4-2 and connect leads to t proper terminals.

(5) Refer to paragraph 4-17 and install the co trol panel.

4-21. Terminal Blocks

a. General. Terminal blocks (fig. 4-6) are located the compressor section, condenser fan section, ev porator fan section, and inside the control box.

b. Inspection. Inspect the terminal blocks for crac and loose or missing hardware. If the terminal bloc are cracked, they must be replaced.

c. Removal. Disconnect and tag all leads. Remo the screws attaching the terminal block to t mounts.

d. Installation. Install the screws attaching t terminal blocks to the mounts. Connect all leads the proper terminals.

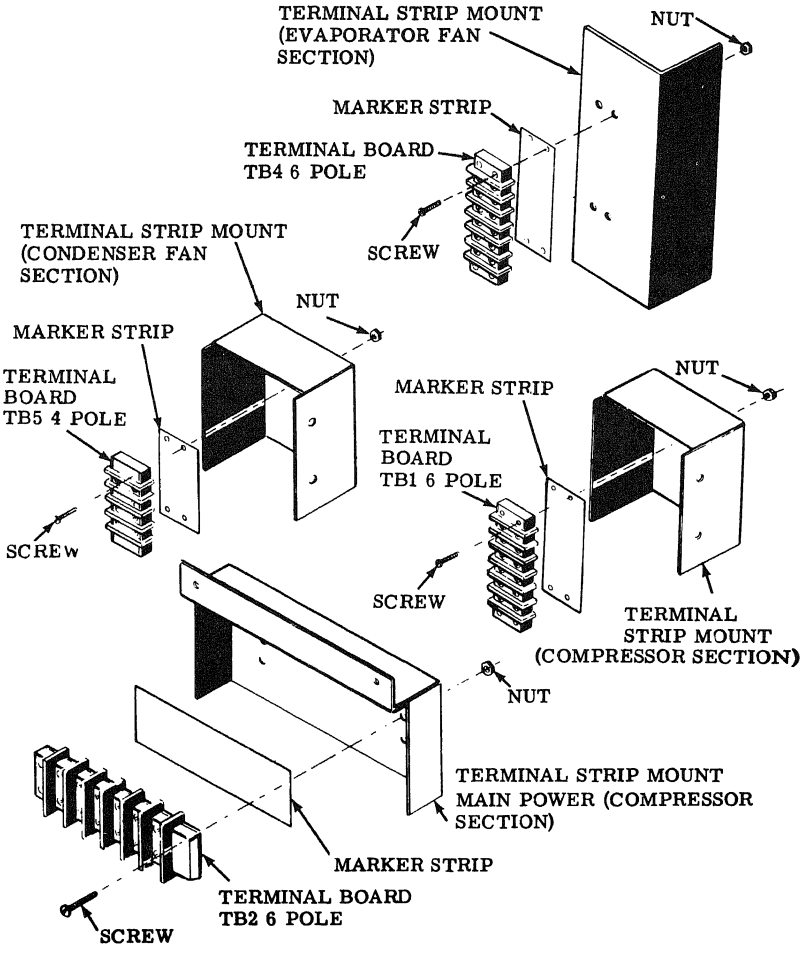


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Figure 4-6. Terminal blocks.

4-22. General

Organizational maintenance of compressor motor (fig. 4-7), evaporator fan motor and condenser fan motor is limited to inspection, test and replacement. Refer to paragraph 4-26 for organizational maintenance instructions for evaporator and condenser fan motor.

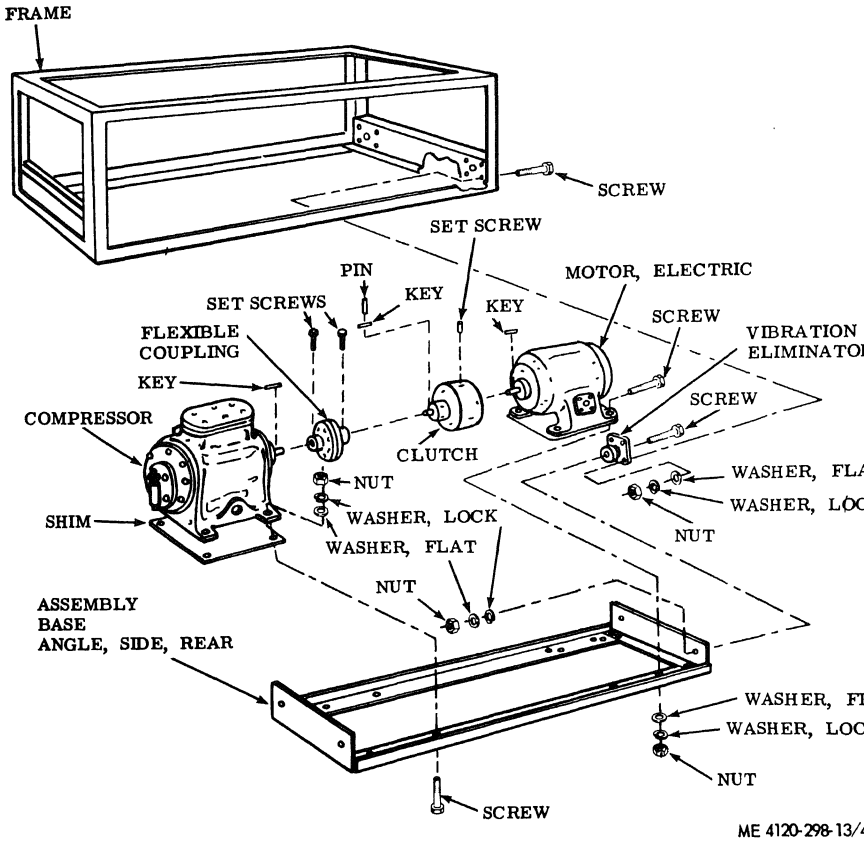
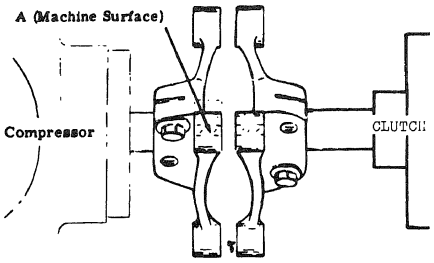


Figure 4-7. Compressor, coupling, clutch and compressor motor.

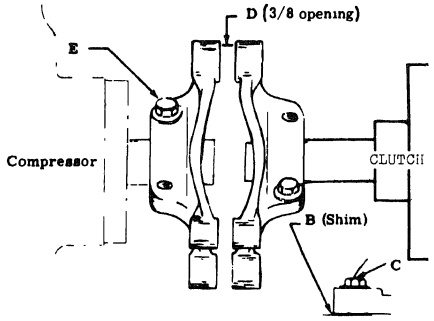
-23. Compressor Motor

a. Maintenance and Adjustment. Inspect the compressor motor for cleanliness, secure mounting screws (fig. 4-7) and check alignment to prevent excessive stress on flexible coupling (fig. 4-8).



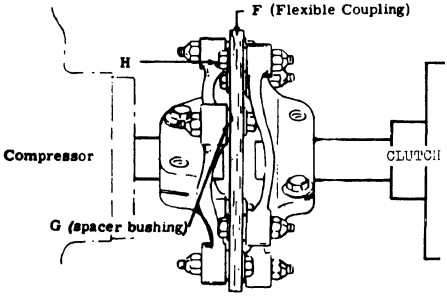
STEP 1: POSITION HUB ONTO COMPRESSOR AND MOTOR SHAFTS AND MOVE SPIDER FINGERS FLUSH TO OPPOSITE MATE AND LINE UP MACHINE SURFACES (SEE A). TO ALIGN SPIDER FINGERS FOR HORIZONTAL ALIGNMENT, LOOSEN MOUNTING BOLTS ON COMPRESSOR OR MOTOR AND MOVE FORWARD OR BACKWARDS.

TOP VIEW



STEP 2: ALIGN SPIDER FINGERS IN VERTICAL POSITION, SHIM MOTOR OR COMPRESSOR TO RAISE OR LOWER (SEE B). TIGHTEN BOLTS ON COMPRESSOR AND MOTOR MOUNTINGS (SEE C). MOVE ONE SPIDER FINGER BACK TO GIVE 3/8 OPENING (SEE D). TIGHTEN BOLTS OF SPIDER FINGERS TO COMPRESSOR AND MOTOR SHAFTS (SEE E).

FRONT VIEW

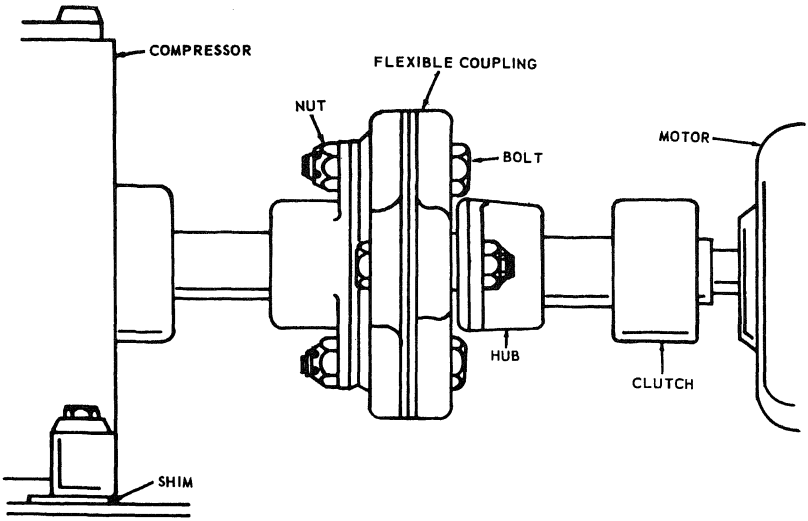


STEP 3: TURN TO STAGGER SPIDER FINGERS - INSERT FLEXIBLE COUPLING (SEE F). INSERT SPACER BUSHING (SEE G). ADD FLAT WASHER, BOLT AND HUGLOCK NUT AND TIGHTEN (SEE H).

FINAL ASSEMBLY

ME 4120-298-13/4-8 (1)

Figure 4-8. Compressor and motor alignment (Thermo-King Model S18-104TM5) sheet 1 of 2.



STEP 1. SLIDE HUB ONTO CLUTCH, ALIGNING KEYWAY IN HUB WITH 1/4 X 1/4 KEY ON CLUTCH.
STEP 2. SLIDE HUB ONTO COMPRESSOR SHAFT, ALIGNING KEYWAY IN HUB WITH KEY ON COMPRESSOR SHAFT.
STEP 3. SHIM COMPRESSOR TO RAISE OR LOWER TO ALIGN COMPRESSOR SHAFT WITH CLUTCH.
STEP 4. INSERT FLEXIBLE COUPLING. ADD BOLTS AND NUTS. TIGHTEN NUTS.

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Figure 4-8. Compressor and motor alignment (Keco Model F18000-6 and Mecom Model 19099-G18000-5-Mec) sheet 2 of 2.

b. Removal.

(1) Disconnect power leads from magnetic contactor (5, fig. 4-4) at terminal block.

(2) Refer to figure 4-7 and remove the four mounting bolts.

(3) Loosen the two bolts holding flexible coupling to centrifugal clutch shaft, slide motor and centrifugal clutch away from compressor and flexibl coupling and lift out.

c. Installation.

(1) Position motor on mounting supports an secure centrifugal clutch.

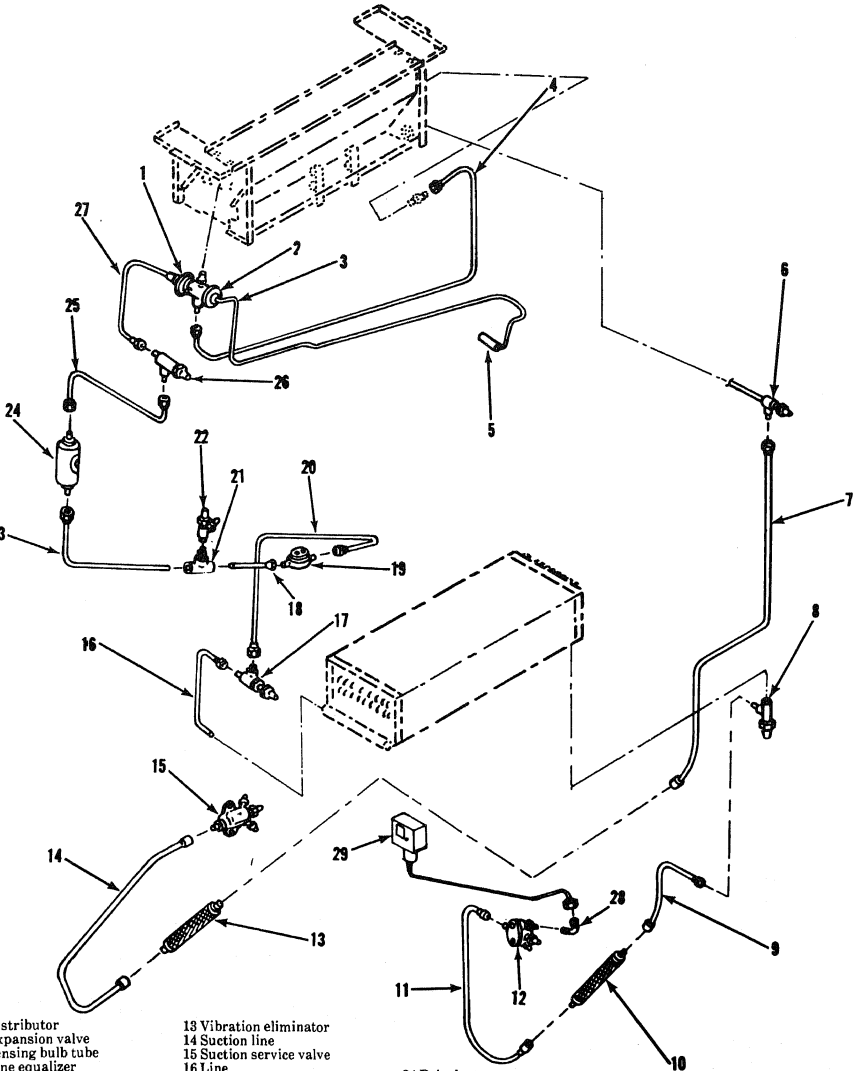
(2) Bolt flexible coupling together and bolt moto to frame.

(3) Check for alignment (fig. 4-8).

Section X. REFRIGERANT SYSTEM

4-24. General

The refrigerant system (fig. 4-9) consists of the compressor, evaporator, condenser, receiver tank, dehydrator, expansion valve, valves and tubing as principal components. As the refrigerant, R-12 is compressed by the compressor it becomes a hot gas. Upon passing through the condenser the heat is expelled and the R-12 becomes liquid under pressure, and enters the receiver tank. It is drawn through th dehydrator and metered through the expansic valve, becoming a low pressure liquid as it enters th evaporator. As it acquires heat in the evaporator becomes a low pressure gas and returns to the con pressor to recycle. Organizational maintenance c this system is limited to necessary servicing whic does not include opening the refrigerant system any way.



stributor
xpansion valve
nsing bulb tube
ne equalizer
nsing bult
ction line shutoff valve
ction line
scharge line shutoff valve
ne assembly
bration eliminator
ne
scharge service valve

13 Vibration eliminator
14 Suction line
15 Suction service valve
16 Line
17 Receiver outlet valve
18 Flare nut
19 Sight glass
20 Line
21 Tee
22 Charging valve
23 Line

24 Dehydrator
25 Dehydrator outlet line
26 Dehydrator outlet valve
27 Line
28 Elbow
29 High pressure switch

Figure 4-9. Refrigerant piping system.

4-25. Compressor Clutch and Flexible Coupling

a. General. Organizational maintenance on the compressor clutch and flexible coupling is limited to cleaning, inspection, and replacement of the compressor clutch and flexible coupling (fig. 4-7 and 4-8).

b. Removal. Loosen the setscrews that lock the flexible coupling hub (fig. 4-7) to the clutch shaft. Remove four bolts attaching the flexible coupling. Loosen the setscrew holding the clutch to the compressor drive motor shaft and remove the centrifugal clutch. The motor bolts may also require removal to allow clearance when replacing these items.

c. Cleaning and Inspection. Clean the clutch with a rag dampened with an approved solvent. Inspect the clutch for traces of mercury. If there are any traces of mercury, or if the clutch was removed for a definite cause replace the clutch.

d. Installation. Slide the clutch onto the compressor motor (fig. 4-7) shaft. Tighten the setscrew locking the clutch to the motor shaft. Install the flexibl coupling (fig. 4-8).

4-26. Fan Assembly, Evaporator, and Condenser

a. General. The condenser and evaporator fa assemblies consist of dual squirrel cage type fan and housings, and each is powered by a 120 V, singl phase, 50/60 HZ electric motor of 1/3 H.P. Th motors are equipped with permanently lubricate ball bearings and overload protectors which rese themselves automatically after cooling. The remova of fan motors are discussed as an assembly, since i is not possible to remove either component withou removing the entire assembly (fig. 4-10). The assem blies can be disassembled after removal (fig. 4-11 Evaporator and condenser fan assemblies are re moved, disassembled, assembled and replaced in like manner.

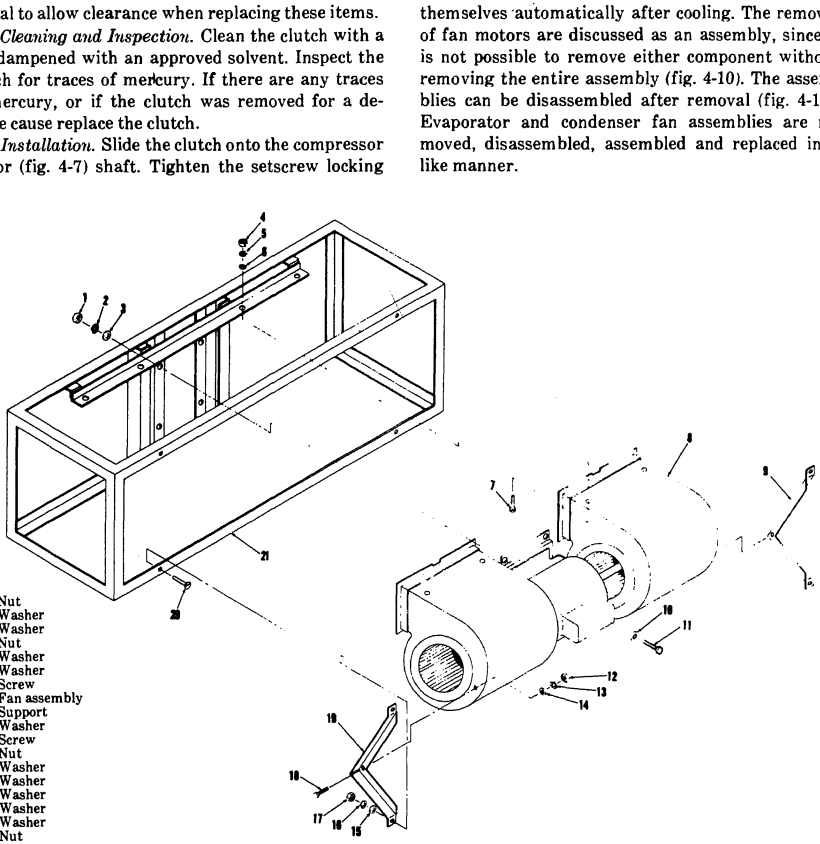
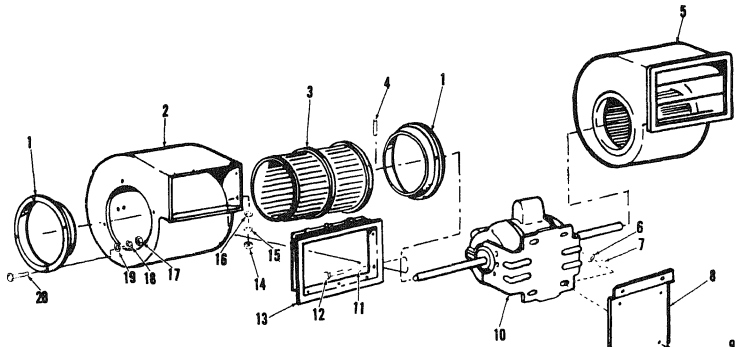


Figure 4-10. Condenser and evaporator fan assembly removal and installation.



1 Orifice
2 Housing
3 Wheel
4 Setscrew
5 Housing and wheel
6 Nut
7 Washer
8 Base
9 Screw
10 Motor
11 Washer
12 Screw
13 Grille
14 Nut
15 Washer
16 Washer
17 Nut
18 Washer
19 Washer
20 Screw

Figure 4-11. Condenser and evaporator fan, disassembly and reassembly.

WARNING

Disconnect the power leads before removing a fan assembly.

b. Removal.

(1) Remove front, rear and end panels from condenser or evaporator fan section (fig. 3-1).

(2) Remove and tag the leads from terminal blocks (fig. 4-6).

(3) Refer to figure 4-10 and remove fan assembly from frame.

c. Disassembly.

(1) Refer to figure 4-11, remove screws (20) from orifice (1) next to motor (10) and remove fan housing (2).

(2) Remove setscrew (4) from fan wheel (3) and slide fan off motor shaft. Remove the orifice (1) next to the motor.

(3) If the motor is to be replaced remove screws (9) and remove base (8).

d. Reassembly.

(1) Install the motor base (8) to the motor (10) with screws (9) washers (7) and nuts (6).

(2) Place an orifice (1) onto the motor shaft, slide the fan (3) over the shaft and place the fan housing (2) over the fan (3).

(3) Install the screws (20), attaching the orifice to the housing.

e. Installation.

(1) Refer to figure 4-10 and attach the motor to the frame. Do not tighten screws.

(2) Align the fan assembly (8) with the supports and install the screws (7) and (18).

(3) Position the fan housing so the fans will turn freely. Center the fan in the housing so the gap between the fan and orifices are equal. Tighten setscrew (4, Fig 4-11) and motor mounting screws (10, Fig 4-10).

(4) Connect motor leads to the terminal blocks (fig. 4-6).

(5) Check direction of rotation of the fan motors. The evaporator fan motor must be wired to rotate clockwise and the condenser fan motor must be wired to rotate counterclockwise. Direction is determined by looking at motor terminal end. Replacement motors are shipped, wired for counterclockwise rotation. To reverse directions of rotation reverse the red and black leads inside motor junction box. After the motors are installed and wiring has been connected, energize the unit to verify proper rotation. Direction arrows are marked on both the fans and housing.

(6) Refer to figure 3-1 and install panels.

CHAPTER 5
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

5-1. Tools and Equipment

There are no tools and equipment authorized for issue with the air conditioner.

5-2. Special Tools and Equipment

There are no special tools and equipment required for use with the air conditioner.

5-3. Maintenance Repair Parts

Repair parts and equipment required for direct port maintenance of the air conditioner are li and illustrated in TM 5-4120-298-23P.

Section II. TROUBLESHOOTING

5-4. General

This section will provide direct support maintenance personnel information useful in diagnosing and correcting unsatisfactory operation or failure of the air conditioner unit and its components.

5-5. Troubleshooting

Malfunctions of the air conditioning unit or ponents which may occur are listed in table 5-1. malfunction stated is followed by probable caus the trouble. The corrective action recommende described opposite the probable cause.

Table 5-1. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Insufficient cooling	*a.* Insufficient refrigerant in system	*a.* Add refrigerant (para 5-10).
	b. Defective expansion valve	*b.* Replace expansion valve (para 5-21).
	c. Discharge service, discharge shutoff, receiver outlet, suction line shutoff, or suction line service valves closed	*c.* Open valve (para 2-2).
	d. Air in refrigerant system	*d.* Purge refrigerant system (para 5-11) charge with refrigerant (para 5-12).
	e. Clogged drier	*e.* Replace drier (para 5-19).
	f. Restriction in liquid line	*f.* Open the system and remove restrict (para 5-9).
	g. Refrigerant overcharge	*g.* Purge the refrigerant system (para 5- until proper charge for system is at
2. Air conditioner noisy during operation	*a.* Compressor oil level low	*a.* Add oil to the compressor (para 7-2)
	b. Compressor sluggish due to overcharge	*b.* Purge the refrigerant system (para 5- until proper charge for system is at
3. Compressor short cycles	*a.* Excessive refrigerant in refrigerant system	*a.* Purge excessive refrigerant (para 5-1 proper charge for system is attained
	b. Air or non-condensible gas in refrigerant system	*b.* Purge the refrigerant system (para 5- Charge system with refrigerant (par 5-12).
4. Air conditioner operates continuously	Insufficient refrigerant in refrigerant system	Add refrigerant (para 5-12).
5. Air conditioner stops due to high pressure switch tripping	Refrigerant overcharge, condenser air flow restricted	Purge the refrigerant system (para 5- until proper charge for system is at Clean condenser or remove obstruc
6. Compressor knocks or develops sudden noise	*a.* Defective expansion valve	*a.* Adjust or replace expansion valve (p
	b. Internal failure (connecting rod, piston, bearing, etc), in compressor	*b.* Remove and replace compressor (pa

Section III. GENERAL MAINTENANCE

5-6. Refrigerant System

Nearly all operations for correction of malfunctions found in troubleshooting, or maintenance activities of direct support, require that the refrigerant system be opened to some extent. Refer to the following paragraphs 5-7 through 5-12 for steps to be taken preparatory to performing maintenance.

5-7. Pressure Gages, Installation and Removal

a. Backseat the suction service valve and remove cap from port (fig. 5-1).

b. Install and tighten a compound pressure gage (30 inches vacuum, 100 pounds pressure).

c. Turn valve stem one turn clockwise so gage will register.

d. Backseat discharge service valve and remove sensing element of high pressure switch from the service valve port by removing flare nut.

e. Install high pressure gage (0 to 300 pounds pressure).

f. Turn valve stem one turn clockwise so gage will register.

g. After testing is completed, or gages are no longer required for other purposes, backseat at the suction and discharge pressure valves. Remove the gages and replace port cap and high pressure switch sensing element. Open suction service and discharge service valve fully to return unit to service.

5-8. Pumping Down Refrigerant System

a. General. Before the refrigerant system can be opened, it is necessary to liquefy as much refrigerant as possible and contain it in the receiver tank. This procedure of transferring refrigerant out of the system to the receiver is called pumping down.

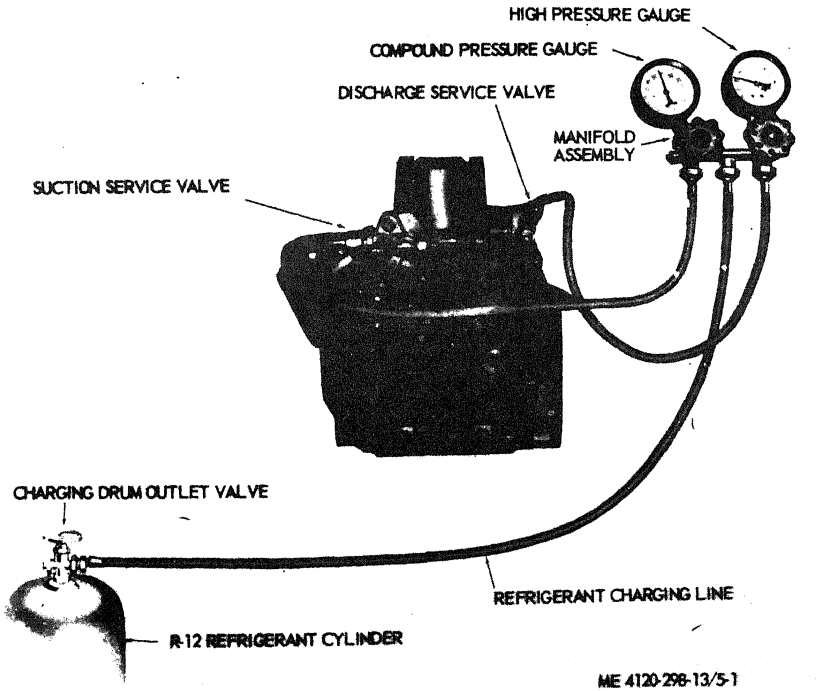


Figure 5-1. Pressure gage installation and charging.

b. Pumping Down. To pump down the system proceed as follows:

(1) See that all valves are open except charging valve.

(2) Close the receiver outlet valve by turning valve stem fully clockwise.

(3) Install a suction pressure gauge on the compressor suction service valve (fig. 5-1).

(4) Operate unit until suction pressure gauge registers 5 to 10 in. mercury vacuum.

(5) Shut off machine and observe pressure gauge for a few minutes. If pressure rebuilds, repeat step (4) above until pressure does not rebuild appreciably.

(6) Crack receiver outlet valve until 3 to 4 psig is indicated on suction gauge.

(7) Close condenser shutoff valve by turning valve stem clockwise as far as it will go.

(8) Remove suction pressure gauge.

5-9. Opening System

Before opening the refrigerant system the pressure in the system should be known. If the system is under high pressure, excessive loss of refrigerant will occur. If opened under vacuum, air is drawn into the system which will cause operating difficulties. If the pressure gauge indicates a vacuum after pumping down, open the receiver outlet valve slightly to build 3 to 4 pounds of pressure in the system.

5-10. Adding Refrigerant

a. General. Bubbles or a milky or frothy appearance of the refrigerant passing the sight glass in normal operations is indication the system needs additional refrigerant. 13.0 pounds of R-12 is the normal refrigerant charge in the unit when shipped. Test for leaks with a halide torch, repair leak and add refrigerant.

b. Adding Refrigerant. In adding refrigerant, connect the service gauge test hookup shown in figure 5-1 and proceed as follows:

(1) Turn stem of suction service valve counterclockwise as far as possible.

(2) Connect line from R-12 charging drum to connection of compressor suction valve (fig. 5-1). Leave connection loose at compressor valve and open charging drum outlet valve long enough to purge all air from the charging line through the loose connection. Tighten charging line connection at compressor suction valve.

(3) Turn suction service valve clockwise 3 or 4 turns.

(4) Open charging drum outlet valve 1 or 2 turns.

(5) Turn selector switch to COOLING.

(6) Observe sight glass (fig. 5-6) while unit is operating. When frothiness disappears, turn suction service valve counterclockwise as far as it will go. Watch sight glass for approximately 10 minutes to be sure bubbles do not appear.

(7) Close outlet valve of charging drum and back seat suction service valve.

(8) Disconnect charging line from suction valve and replace bonnet and nut.

(9) Return unit to normal operation.

5-11. Purging Refrigerant System

a. General. When the refrigerant system is opened for servicing, there is a possibility of air entering the system. Before closing the system, that portion opened must be purged of air.

b. Purging the Low Side. When the unit is pumped down to service the low side and there is R-12 in the receiver, proceed as follows:

(1) Front seat the discharge service valve if it is open. Remove the cap from the service port of the suction service valve on the compressor.

(2) Open the receiver outlet valve slightly and allow gas to escape through the suction valve port for a few seconds. Replace the cap on the service valve port.

(3) Open the receiver outlet valve slightly and build pressure to 30 pounds.

(4) Open all valves fully and place unit in operation to inspect refrigeration charge.

c. Purging the High Side. When the unit has been pumped down to service the high side and there is R-12 in the receiver, the procedures is as follows:

(1) Open the discharge service valve about halfway, so the port is open to the condenser. Remove cap from service port.

(2) Open condenser shutoff valve slightly and allow gas to escape for a few seconds. Replace cap in service valve port.

(3) Open receiver outlet valve slightly and build pressure to 30 pounds. Test for leaks.

(4) Open all refrigerant valves (turn discharge service valve ½ turn clockwise) and place unit in operation to inspect the refrigerant charge.

d. Purging the System When Unit Has Lost Complete Charge. When the unit has lost its complete charge it is very important that the system be completely purged of air before recharging.

(1) Attach charging line to suction service valve port.

(2) Backseat the discharge service valve and remove the cap from the port.

(3) Open the suction service valve so both port and compressor are open.

(4) Open the valve on the refrigerant drum and build 30 pounds pressure in system.

(5) Test for leaks using halide detector torch.

(6) Release pressure in system and replace cap on discharge service valve port.

(7) Using an evacuator, pull a 20 to 25 inch vacuum on the refrigerant system, attaching the vacuum line to suction service valve port. Purge with gas from freon drum and again pull vacuum.

(8) When 20 to 25 inch vacuum is reached, backseat the suction service valve.

(9) Remove the evacuator vacuum line.

5-12. Charging the Refrigerant System With Full Charge

a. After completion of purging in paragraph 5-11 the unit is ready for recharging.

b. Connect the refrigerant charging hookup as shown in figure 5-1 with a full drum of R-12. Weigh the drum so that 13 pounds can be measured into the system.

NOTE

The R-12 drum for recharging should be equipped with large capacity drier.

c. Attach charging line to unit. Do not tighten.

(1) If charging line is attached to suction service valve, be sure drum is upright so only gas will be drawn off.

(2) If charging line is attached to charging valve in condenser fan section, close valve at condenser outlet, and invert drum so only liquid will be drawn off.

d. Open R-12 drum valve slightly and then close to purge air from charging line. Tighten charging line on service valve fitting.

e. Open valve on R-12 drum about 2 turns.

f. Open the system charging valve about 2 turns and allow pressure to equalize.

g. Start unit and run until 13 pounds of R-12 is added.

h. Backseat suction service valve (or close charging valve).

i. Remove charging line from valve.

j. Replace cap on valve.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS

5-13. Frame Assembly

a. Removal.

(1) Refer to paragraph 3-8 and remove inclosure panels.

(2) Pump down refrigerant system (para 5-8).

(3) Disconnect refrigerant system between sections (fig. 4-9).

(4) Disconnect wiring at terminal block (para 4-21).

(5) Disconnect bolts securing sections together.

(6) Refer to figures 5-2, 5-3, 5-4, 5-5 and 4-7, and remove components from each section as required.

1 Frame
2 Nut
3 Washer
4 Washer
5 Screw
6 Outlet frame
8 Nut
9 Washer
10 Washer

1 Screw
2 Screw
3 Orifice
4 Strip
5 Blower
6 Nut
7 Washer
8 Washer
9 Screw
0 Screw

21 Support
22 Screw
23 Orifice
24 Housing
25 Setscrew
26 Blower
27 Nut
28 Washer
29 Screw
30 Base

31 Nut
32 Washer
33 Washer
34 Screw
35 Motor
36 Receptacle
37 Rivet
38 Screw
39 Housing
40 Support

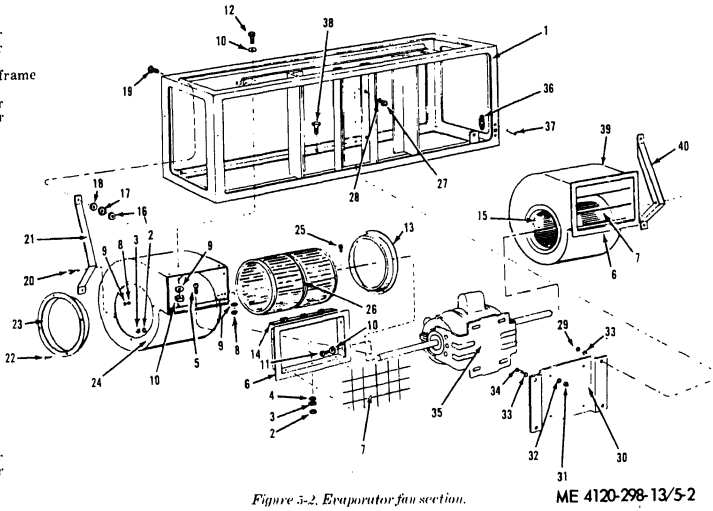


Figure 5-2. Evaporator fan section.

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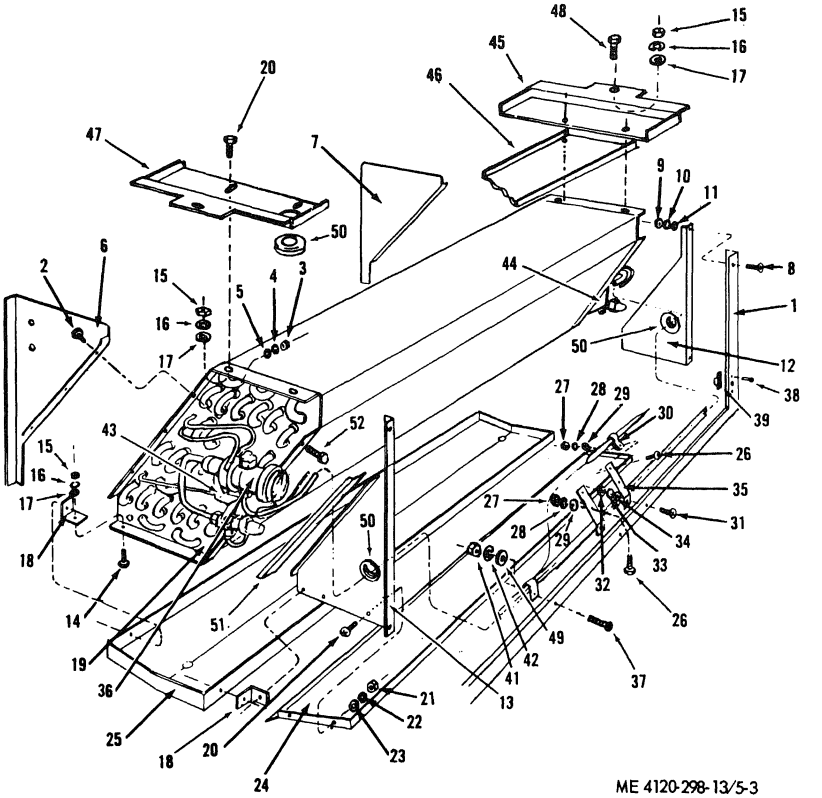
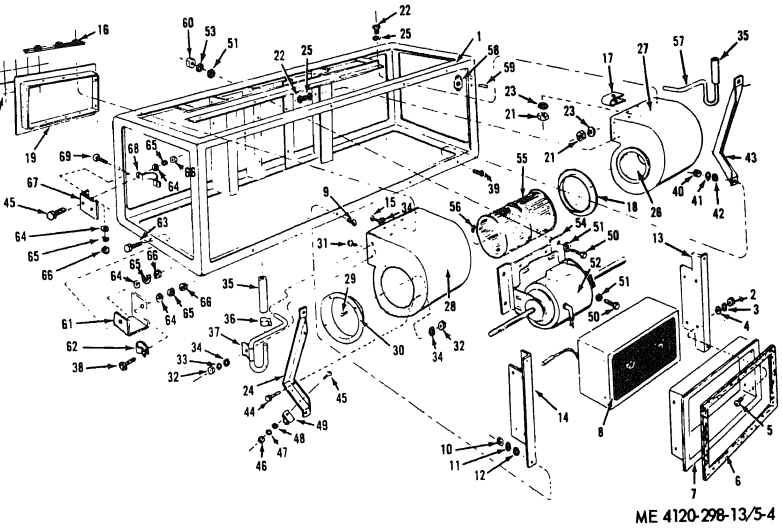


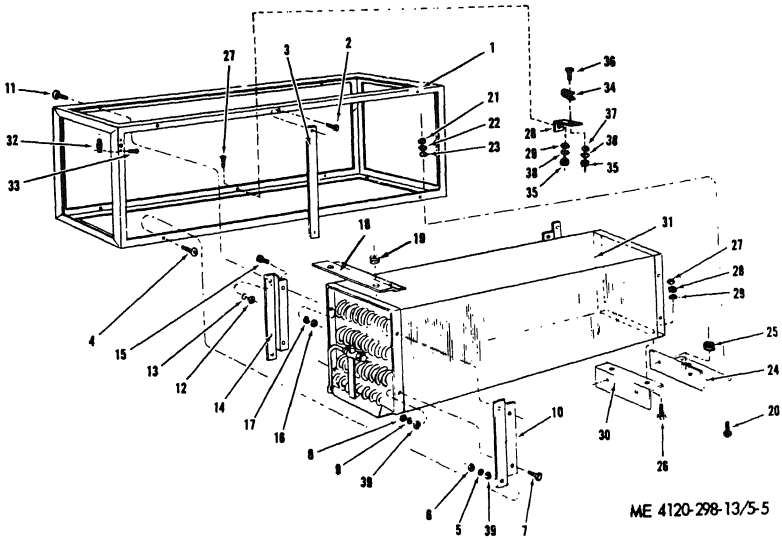
1 Frame
2 Screw
3 Nut
4 Washer
5 Washer
6 Support
7 Support
8 Screw
9 Nut
10 Washer
11 Washer
12 Support
13 Support
14 Screw
15 Nut
16 Washer
17 Washer
18 Bracket
19 Coil
20 Screw
21 Nut
22 Washer
23 Washer
24 Pan extension
25 Pan
26 Screw
27 Nut
28 Washer
29 Washer
30 Clamp
31 Screw
32 Nut
33 Washer
34 Washer
35 Bracket
36 Valve
37 Screw
38 Rivet
39 Receptacle
40 Clamp
41 Nut
42 Washer
43 Bracket
44 Bracket
45 Baffle
46 Baffle
47 Baffle
48 Screw
49 Washer
50 Grommet
51 Trough

Figure 5-3. Evaporator section.



1 Frame
2 Nut
3 Washer
4 Washer
5 Screw
6 Insulation
7 Frame
8 Control box
9 Screw
10 Nut
11 Washer
12 Washer
13 Support
14 Support
15 Screw
16 Strip
17 Clamp
18 Orifice
19 Frame
20 Grille
21 Nut
22 Screw
23 Washer
24 Support
25 Washer
26 Blower
27 Housing
28 Housing
29 Screw
30 Orifice
31 Screw
32 Nut
33 Washer
34 Washer
35 Hose
36 Clamp
37 Trap
38 Screw
39 Screw
40 Nut
41 Washer
42 Washer
43 Support
44 Screw
45 Screw
46 Nut
47 Washer
48 Washer
49 Clamp
50 Screw
51 Washer
52 Motor
53 Washer
54 Base
55 Blower
56 Screw
57 Trap
58 Receptacle
59 Rivet
60 Nut
61 Bracket
62 Clamp
63 Screw
64 Washer
65 Washer
66 Nut
67 Support
68 Strap
69 Screw

Figure 5-4. Condenser fan section.



1 Frame
2 Screw
3 Support
4 Screw
5 Washer
6 Nut
7 Screw
8 Nut
9 Lockwasher
10 Support
11 Screw
12 Nut
13 Washer
14 Support
15 Screw
16 Nut
17 Washer
18 Support
19 Grommet
20 Screw
21 Nut
22 Washer
23 Washer
24 Support
25 Grommet
26 Screw
27 Screw
28 Bracket
29 Washer
30 Support
31 Coil
32 Receptacle
33 Rivet
34 Clamp
35 Nut
36 Screw
37 Washer
38 Washer
39 Washer

Figure 5-5. Condenser section.

b. Installation.

(1) Install components in section frames as required.

(2) Stack sections and bolt together.

(3) Reconnect refrigerant system (fig. 4-9) and connect wiring (para 4-21).

(4) Purge refrigerant system of air (para 5-11).

(5) Install enclosure panels para 3-8.

5-14. Condenser Blower Top Panel

a. Removal.

(1) To remove the top panel from the condenser fan section follow removal instructions in paragraph 5-13 to the extent necessary for separating the evaporator section and condenser section.

(2) Loosen fasteners and remove top panel (fig. 3-1) from condenser fan section.

b. Installation.

(1) Position and secure top panel to condense fan section.

(2) Refer to paragraph 5-13 and reassembly uni sections.

5-15. Compressor

a. Removal.

(1) Refer to paragraph 5-8 and pump down re frigerant system.

(2) Close the discharge and suction service valves

(3) Remove line to high pressure cutout switch.

(4) Refer to paragraph 4-23 and remove com pressor motor.

(5) Refer to paragraph 4-25 and remove flexibl coupling.

(6) Refer to figure 4-7 and remove compressor.

b. Installation.

(1) Refer to figure 4-7 and install the compressor.

(2) Refer to paragraph 4-25 and install flexible coupling.

(3) Refer to paragraph 4-23 and install compressor motor.

(4) Replace line to high pressure cutout switch.

(5) Refer to paragraph 5-12 and charge the system.

5-16. High Pressure Cutout Switch

a. General. The high pressure cutout switch (fig. 4-7) is located in the compressor section. It is preset at the factory to trip at 280 psi, and is wired in the circuit to the thermostat so that operation of all motors is stopped if discharge pressure in the refrigerant system reaches that point. The high pressure switch cannot be repaired and must be replaced if defective.

b. Removal.

(1) Refer to figure 3-1 and remove panels from the compressor section.

(2) Backseat the discharge service valve and remove high pressure line flare nut at compressor.

(3) Remove cover plate retaining screw at top of switch housing and lift off cover plate.

(4) Remove the high pressure cutout switch from its mounting and detach electrical leads.

c. Installation.

(1) Mount the switch in position and attach electrical leads (position of electrical leads is unimportant).

(2) Install cover plate and secure with screw.

(3) Attach the high pressure line with flare nut, but do not tighten.

(4) Open discharge valve slightly to purge air from line, then tighten flare nut.

(5) Open discharge valve.

(6) Refer to figure 3-1 and install panels.

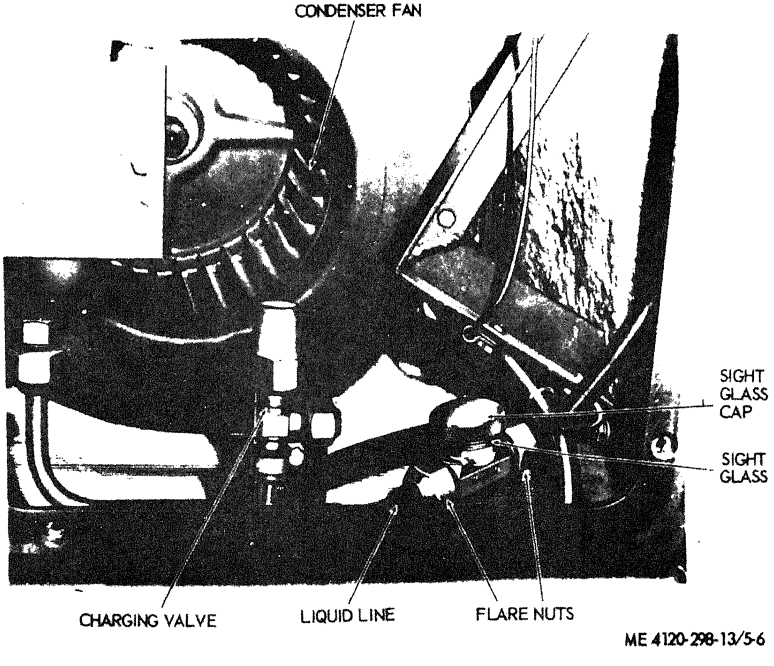


Figure 5-6. Sight glass assembly.

5-17. Sight Glass Assembly

a. General. The liquid sight glass (fig. 5-6) is in the condenser fan section (fig. 5-4) on the left end, facing the unit. It indicates low refrigerant charge.

b. Removal.

(1) Refer to paragraph 5-8 and pump down refrigerant system.

(2) Refer to figure 3-1 and remove condenser fan end panel.

(3) Close shutoff valve and outlet valve in liquid line (fig. 2-1).

(4) Loosen flare fittings (fig. 5-4) and remove sight glass.

c. Installation.

(1) Install sight glass and tighten flare fittings.

(2) Purge opened section of refrigerant system of air (para 5-11).

(3) Refer to paragraph 5-12 and charge the system.

(4) Open valves to restore unit to service.

(5) Replace end panels (fig. 3-1).

5-18. Condenser

a. General. The condenser coil may be removed from its section without disassembly of other sections of the unit. Caution should be exercised to prevent damage to fins.

b. Removal.

(1) Refer to figure 3-1 and remove front, rear and end panels from the condenser section.

(2) Refer to paragraph 5-8 and pump down refrigerant system.

(3) Close valves to isolate the condenser.

(4) Disconnect compressor discharge line at condenser, and condenser outlet at service valve.

(5) Refer to figure 5-5, disconnect receiver line support bracket (18) and remove center vertical frame support (3).

(6) Unbolt condenser frame mount supports (10) (14) (24) and (30), frame (1) and condenser coil (31).

(7) Lift condenser coil out the front of the unit.

c. Installation.

(1) Position condenser coil (31) in frame.

(2) Attach frame mount supports ((10) (14) (24) and (30)) and bolt to section frame (1).

(3) Place support bracket (18) in position on receiver line and bolt to frame.

(4) Attach and bolt center vertical frame support (3).

(5) Connect refrigerant lines.

(6) Purge opened refrigerant system (para 5-11).

(7) Open valves and return unit to service.

(8) Replace panels (fig. 3-1).

5-19. Drier

a. General. The drier (24, fig. 4-9) is located in th condenser fan section. It is in the refrigerant liqui line to remove and retain foreign substance in th R-12. The drier should not be replaced with equi ment of lesser capacity than the original equipmen Install new drier whenever refrigerant system opened.

b. Removal.

(1) Refer to figure 3-1 and remove panels fro the condenser fan section.

(2) Refer to paragraph 5-8 and pump down th refrigerant system and close liquid line shut o valve.

(3) Disconnect flare nuts at drier inlet and outle

(4) Remove drier.

c. Installation.

(1) Install drier and connect flare nuts at dri inlet and outlet.

(2) Purge opened refrigerant system (para 5-11).

(3) Open shutoff valves and restore unit to ser ice.

(4) Refer to figure 3-1 and install panels.

5-20. Evaporator Assembly

a. General. The evaporator coil (19, fig. 5-3) may b removed from its section without disassembly other sections of the unit. Normally the expansio valve, distributor, suction header and equalizer lin are removed as a part of the evaporator assembly.

b. Removal.

(1) Remove end panels, front panel and filt from evaporator section (fig. 3-1).

(2) Pump down refrigerant system (para 5- and close shutoff valves at both ends of evaporator.

(3) Loosen flare nuts on liquid and suction lines.

(4) Unbolt front supports (6) and (7) figure 5- and rear supports (12) and (13).

(5) Lift evaporator (19) from frame.

c. Installation.

(1) Place evaporator in position in frame.

(2) Place front and rear supports (6), (7), (1 and (13) in position and bolt them to the evaporat and frame.

(3) Connect flare nuts at liquid and suction lines

(4) Purge opened refrigerant system of air (pa 5-11) and open shutoff valves.

(5) Refer to figure 3-1 and replace filter an panels.

5-21. Expansion Valve

a. General. The expansion valve (36, fig. 5-3) may b removed from the distributor which is an intrica part of the evaporator coil (19).

b. Removal.

(1) Remove end panels, front panel and filter from evaporator section (fig. 3-1).

(2) Pump down refrigerant system (para 5-8) and close shutoff valves at both ends of evaporator.

(3) Free expansion valve power bulb, by removing screws in clamp straps, and remove valve body bolts.

(4) Disconnect flare nut and separate equalizer line from expansion valve.

(5) Lift off body of expansion valve leaving distributor flange in place on evaporator coil.

c. Installation.

(1) Position expansion valve assembly in distributor and insert body bolts. Be careful that locating pin in valve cage is engaged in slot in distributor body.

(2) Put epansion valve power bulb in position and secure by tightening screws in clamp strap. Make certain suction tube is clean at point where bulb is mounted.

(3) Connect equalizer line to expansion valve with flare nut.

(4) Purge opened refrigerant system (para 5-11) and open shutoff valves.

(5) Refer to figure 3-1 and replace panels and filter.

CAUTION

Never adjust expansion valve unless absolutely necessary. When adjusting the expansion valve allow at least 20 minutes between each adjustment. Insure that all panels are in place.

d. Adjust. Tape the bulb of a thermometer to suction line near sensing element of expansion valve. Install a pressure gage to read suction pressure. Operate unit on cool for approximately 30 minutes (Thermometer reading must stabilize). Check thermometer and pressure gage. To the suction pressure, add estimated suction line loss (2 psi). Convert this R-12 suction pressure to temperature, and subtract from temperature reading of suction line. The superheat should be 4° F. Remove seal cap on side of valve and turn adjusting stem. Turning adjusting stem to left increases flow and lowers superheat. Turning stem to right decreases flow and raises superheat. Four complete turns will raise or lower superheat approximately 2° F.

5-22. Refrigerant Line Assemblies

Any refrigerant line or component in the refrigerant line system may be removed and replaced if defective. It is necessary to pump down the system (para 5-8), isolate the section to be removed by closing valves closest to inlet and outlet of the affected line or component. Disconnect flare nuts or unsweat soldered joints to remove line or component.

5-23. Vibration Eliminator

Refer to paragraph 5-22 to remove and replace.

5-24. Valves

Refer to paragraph 5-22 to remove and replace.

CHAPTER 6
REPAIR OF ELECTRIC MOTORS

6-1. Compressor Motor

a. Removal. Refer to paragraph 4-23 and remove compressor motor.

b. Disassembly. Refer to figure 6-1 and disassemble the compressor motor.

c. Cleaning and Inspection.

(1) Clean all parts and wipe dry.

NOTE

Bearings are permanently lubricated and should be handled with care.

(2) Inspect bearings for damage or rough operation.

(3) Check main housing, base and end bells for cracks or other damage.

(4) Inspect rotor and shaft assembly for wear, burrs, or other damage.

(5) Inspect stator windings for cracks or cuts in insulation.

(6) Inspect the fan for cracks or other damage.

d. Assembly. Refer to figure 6-1 and reassembl the compressor motor.

e. Installation. Refer to paragraph 4-23 and insta the compressor motor.

6-2. Evaporator and Condenser Fan Motor

a. Removal. Refer to paragraph 4-26 and remov fan assembly.

b. Disassembly. Refer to figure 6-2 and disassembl fan motor.

c. Cleaning and Inspection.

(1) Clean all parts and wipe dry.

(2) Inspect bearings (20) and (23) for damage o rough operation.

(3) Check main housing, base, end shields an fan for cracks or other damage.

(4) Inspect rotor (26) and shaft assembly fo wear burrs, or other damage.

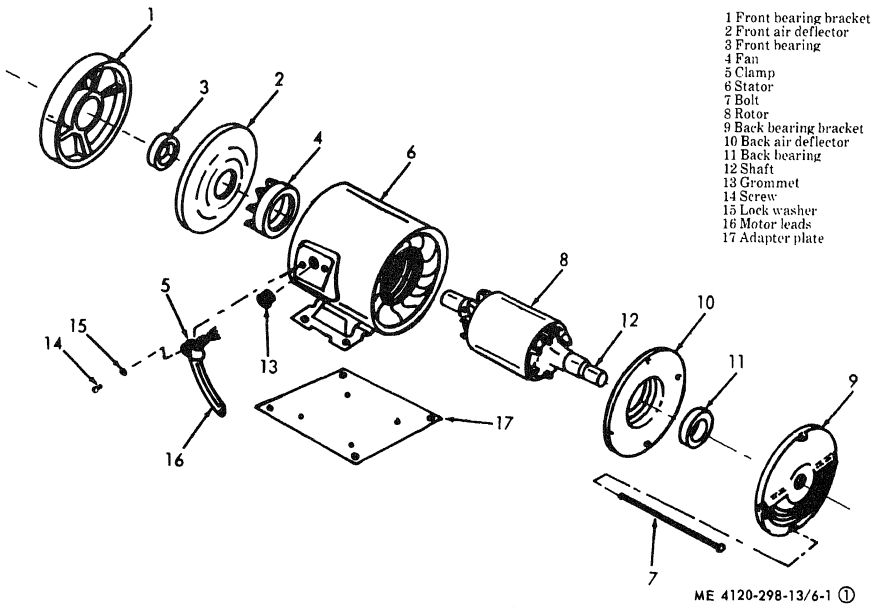


Figure 6-1. Compressor motor (Kevo Model F18000-6 and Mecom Model 19099-G18000-5-Mec) sheet 1 of 2.

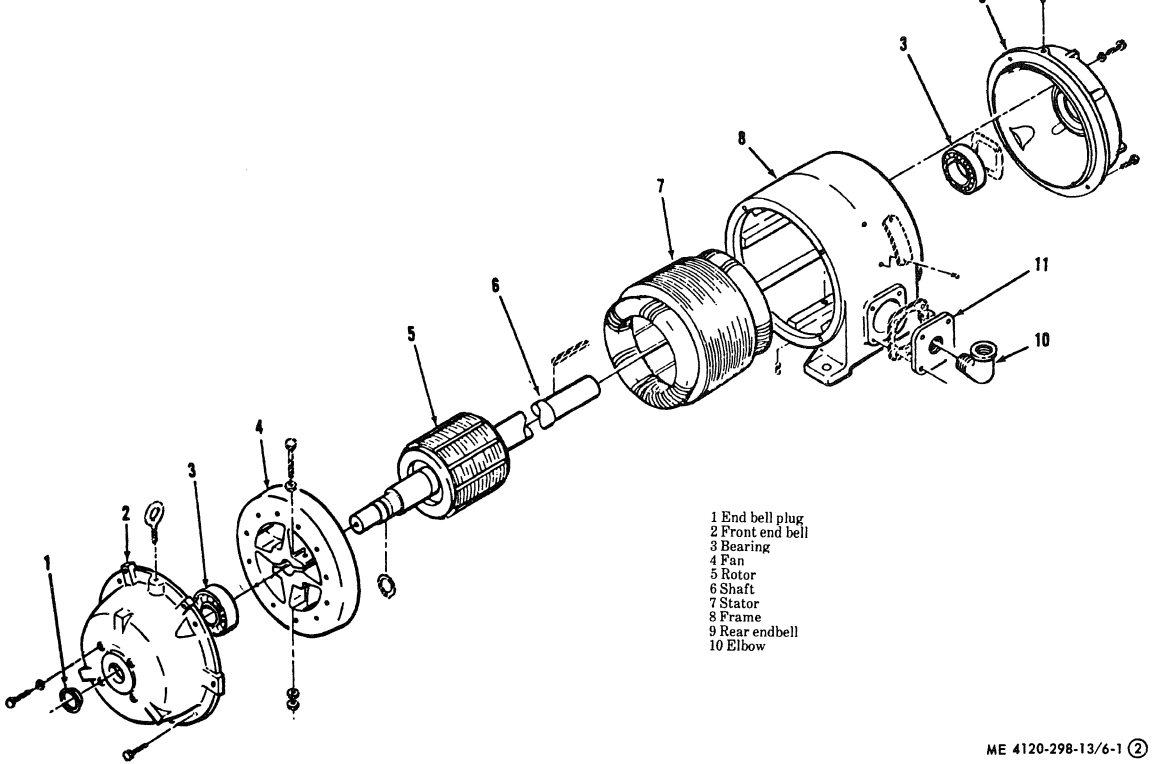
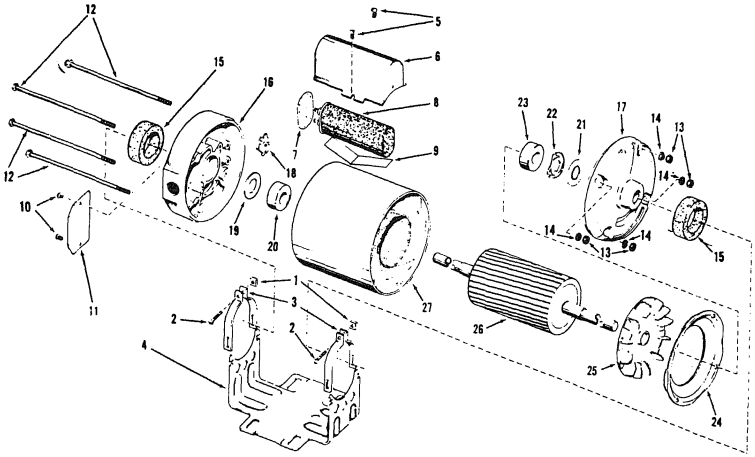


Figure 6-1. Compressor motor (Thermo-King model S18-10ATM5) sheet 2 of 2.



1 Nut	10 Screw	19 Washer	
2 Screw	11 Plate	20 Bearing	
3 Clamp	12 Bolt	21 Washer	
4 Base	13 Nut	22 Washer	
5 Screw	14 Washer	23 Bearing	
6 Case	15 Housing	24 Baffle	
7 Disc	16 Shield	25 Fan	
8 Capacitor	17 Shield	26 Rotor	
9 Spring	18 Switch	27 Stator	

Figure 6-2. Fan motor evaporator and condenser.

(5) Inspect stator (27) windings for cracks or cuts in insulation.

(6) Check capacitor (8) for cracks or other damage.

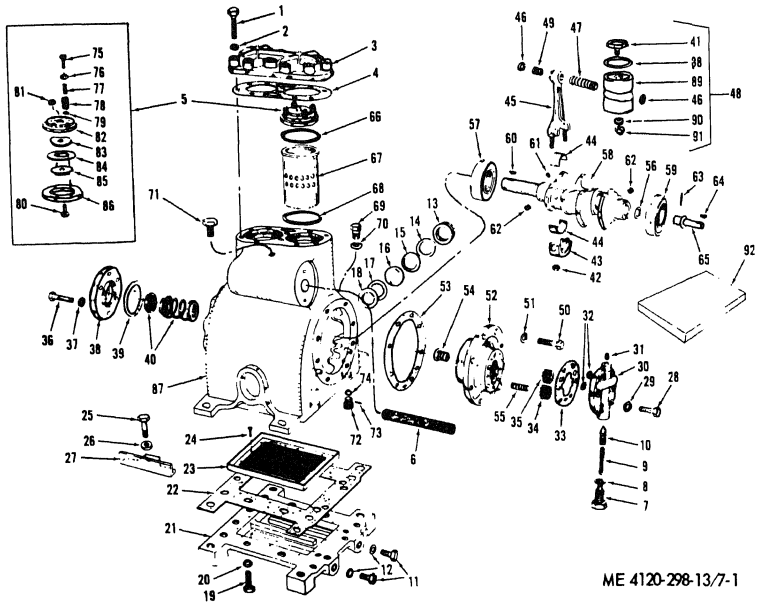
d. Reassembly. Refer to figure 6-2 and reassemb fan motor.

e. Installation. Refer to paragraph 4-26 and insta fan assembly.

CHAPTER 7
COMPRESSOR REPAIR

7-1. Compressor Repair

a. General. The compressor (fig. 7-1) is a two cylinder piston type pump constructed mainly of cast aluminum. The aluminum alloy pistons and the cast iron cylinder sleeves are machined to very close tolerance so piston rings are not required to prev gas from escaping. The piston are driven in recip cating motion by a forged steel crankshaft. The co pressor is equipped with a rotary type refrigerat seal to prevent leaking around the drive shaft.



1 Capscrew
2 Washer
3 Cylinder head
4 Gasket
5 Valve plate assy
6 Screen
7 Plug
8 Washer
9 Spring
10 Plunger
11 Drain screw
12 Washer
13 Nut
14 Washer
15 Gasket
16 Glass
17 Spacer
18 O-ring
19 Capscrew
20 Washer
21 Sump
22 Gasket
23 Screen
24 Screw
25 Screw
26 Washer
27 Baffle
28 Screw
29 Washer
30 Plate
31 Plug
32 Valve
33 Gasket
34 Gear
35 Gear
36 Screw
37 Washer
38 Plate
39 Gasket
40 Seal
41 Head
42 Nut
43 Cap
44 Bearing insert
45 Connecting rod
46 Ring
47 Pin
48 Piston assy
49 Bushing
50 Screw
51 Washer
52 Plate
53 Gasket
54 Bushing
55 Shaft
56 O-ring
57 Bearing
58 Crankshaft
59 Bearing
60 Key
61 Plug
62 Plug
63 Pin
64 Key
65 Shaft
66 Gasket
67 Sleeve
68 Gasket
69 Screw
70 Washer
71 Screw
72 Valve
73 Pin
74 Ball
75 Screw
76 Washer
77 Sleeve
78 Spring
79 Washer
80 Capscrew
81 Nut
82 Cage
83 Spring
84 Reed
85 Support
86 Plate
87 Compressor bo
88 Valve
89 Piston
90 Washer
91 Nut
92 Gasket kit

Figure 7-1. Compressor.

b. Disassembly.

(1) Refer to paragraph 5-15 and remove compressor.

NOTE

Before removing compressor from the unit, note the oil level in the compressor sight glass, and be sure oil level is the same in compressor when installed.

(2) Remove cylinder head bolts and washers (1) and (2) figure 7-1.

(3) Tap edge of cylinder head (3) gently with a soft hammer or block of wood. Remove head and gasket.

(4) Remove valve plate assemblies (5) and suction port screen (6).

(5) Remove oil pressure relief valve from oil pump cover (30).

c. Inspection.

(1) Inspect cylinder head for cracks or warping.

(2) Inspect valve plate assemblies for cracked, dented or broken reeds.

(3) Clean and inspect suction port screen.

(4) Clean and inspect oil pressure relief valve.

d. Assembly.

(1) Replace any components or assemblies that are deficient before reassembly. Always install new gaskets.

(2) Install oil pressure relief valve in pump cover (30).

(3) Install suction port screen (6).

(4) Install valve plate assemblies (5) and cylinder head (3). Torque to 25 foot-pounds.

e. Installation. Refer to paragraph 5-15 and install the compressor.

7-2. Compressor Overhaul

a. General. Overhaul operations of the compressor consist of complete disassembly, inspection, replacement, and reassembly of compressor parts. Initial disassembly and reassembly of compressor cylinder head, valve plate assemblies, suction port screen is covered in paragraph 7-1.

b. Disassembly.

(1) Refer to figure 7-1 and perform the following.

(2) Remove drain plugs (11) and washers (12) and drain oil.

NOTE

Do not reuse this oil.

(3) Remove sight glass assembly (13) through (18).

(4) Remove oil sump assembly (21), gaskets (22), baffle (27), and screen (28).

(5) Remove oil pump cover (30), check valve (7) through (10) and gasket (33).

(6) Remove oil pump gears (34) and (35), and remove key (64).

(7) Remove seal plate (38) and gasket (39).

(8) Remove seal assembly (40).

(9) Push each piston (48) to extreme downstroke position and remove connecting rod nuts (42), rod cap (43) and bear inserts (44).

NOTE

If same inserts are to be used in reassembly they must be returned to same rod bearings and in same position.

(10) Remove connecting rod (45), piston (48) and sleeve assembly (67) through top of cylinder.

NOTE

Keep these sets mated if they are to be reinstalled as an assembly.

(11) Remove the oil pump bearing plate (52) and gasket (53). Bump plate loose with brass, plastic or wood drift pin, or, with a rubber or plastic hammer.

NOTE

Do not pry the plate loose.

(12) Remove oil pump drive shaft (54) and idler shaft (55).

(13) Carefully apply heat to area around drive end ball bearings (57) until it feels hot to the touch. Tap lightly on end of crankshaft (58) with a soft hammer to push bearing out of crankcase.

NOTE

Do not drive or force crankshaft out of compressor body.

(14) Remove O-ring (56) from end of crankshaft.

(15) Do not remove bearings from crankshaft unless they are to be replaced, or connecting rod journals are to be machined. If bearings are to be used in reassembly, they should be pressed off carefully to avoid damage. Note position of shield and seal so seal will be outside when reassembled.

(16) Remove ball check valve assemblies (74) from bottom of compressor.

c. Inspection.

(1) Clean oil sump screen (23) and inspect for damage.

(2) Clean and inspect oil sump plate (21) for cracks.

(3) Inspect oil pump gears (34) and (35) for wear or scoring.

(4) Replace seal assembly (40).

(5) Inspect connecting rod bearing inserts (44), if scored worn, or burned, replace.

(6) Inspect connecting rod bushing (49). If worn replace connecting rod.

(7) Inspect piston (48) and sleeves (67) for scoring or wear.

(8) Inspect suction reed in top of piston (48). If damaged in any way replace.

(9) Clean and inspect crankshaft (58) for scoring or wear of connecting rod journals and plugged oil holes. If damaged, regrind journals, rebalance crankshaft, and use undersize connecting rod inserts in reassembly.

(10) Inspect ball bearings (57) and (59) for rough action.

(11) Inspect oil pump bearing plate bushing (54). Replace if defective.

d. Reassembly.

NOTE

Use all new gaskets and copper washers in reassembly. Coat all parts with compressor oil when reassembling.

(1) Assemble oil sump gasket (22) and screen (23) on sump plate.

(2) Install oil drain plugs (11) and washers (12) in oil sump.

(3) Install sight glass (13) through (18) using spammer wrench.

(4) Install ball check valve assembly (72) through (74) in compressor base.

(5) Press ball bearings on crankshaft (58).

(6) Heat crankshaft bearing housing and slip crankshaft bearing into place. Spin crankshaft to see that it rotates freely.

(7) Install new O-ring (56) in crankshaft.

(8) Install gasket (53) and oil pump bearing plate (52). Tap lightly on plate with soft hammer to seal it properly. Torque nuts to 20-22 foot-pounds.

(9) Place oil pump drive gear key (64) in position on oil pump drive shaft (65) and install oil pump drive gear (35).

(10) Install oil pump idler gear (34) in idler gear stud (55). Spin crankshaft (58) to see it does not bind.

(11) Install oil pump cover gasket (33), oil pump cover (30), washers (29) and capscrews (28).

(12) Assemble piston (48) and connecting r (45) with piston pin (47), using new retainer rin (46). Insert piston assemblies (48) in matching sleev (67). Place new sleeve gaskets (66) and (68) on sleev and position sleeve assemblies in block.

(13) Assemble bearing inserts (44) with co necting rod caps (43) and assemble with connecti rod (45) on crankshaft (58). Torque nuts (42) to 16- foot-pounds. Holding sleeves (67) in body, spin cran shaft (58) for free turning.

(14) Refer to paragraph 7-1 for assembly valve plates (5) cylinder head (3), suction port scre (6) and oil pressure relief valve (7) through (10).

(15) Install seal assembly (46) on drive shaft.

(16) Install seal plate gasket (39) on seal pla (38). Install washers (37) and cap screws (36). Torqu to 16-18 foot-pounds.

NOTE

Make final check for free spinning of crankshaft before installing oil sump.

(17) Install oil sump assembly (21) on crankcas (87) with washers (20) and capscrews (19).

(18) Install oil pressure plug fitting (31).

(19) Add one quart of compressor oil through o filler (69) to same level in compressor as before di assembly.

NOTE

Do not overfill.

(20) Install oil filler plug (69) and washer (70).

e. Installation. Refer to paragraph 5-15 and insta compressor.

Table 7-1. REFRIGERANT PRESSURES

Listed below are normal air conditioner refrigerant pressure at rated conditions. The listing may be used by maintenance personnel as a guide in dete mining if the air conditioner is functioning normally

	Refrigerant Pressure			
Conditioned air external static pressure	Return air temperature	Ambient temperature	Compressor suction pressure (PSIG)	Compressor discharge pressure (PSIG)
0	90°F DB/ 75°F WB	90°F	18 ± 2	175 ± 5
0.25 in H20	90°F DB/ 75°F WB	125°F	30 ± 2	241 ± 5
0.25 in H20	80°F DB/ 67°F WB	95°F	13 ± 2	170 ± 5

CHAPTER 8
ADMINISTRATIVE STORAGE AND DEMOLITION TO PREVENT ENEMY USE

8-1. Administrative Storage

Refer to TM 740-90-1.

8-2. Demolition To Prevent Enemy Use

Refer to TM 750-244-3.

APPENDIX A
REFERENCES

-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers For Army Users

-2. Lubrication

C9100IL	Fuels, Lubricants, Oils and Waxes

-3. Painting

TM 9-213	Painting Instructions for Field Use

-4. Radio Suppression

TM 11-483	Radio Interference Suppression

-5. Maintenance

TM 5-4120-298-23P	Operator, Organizational, and Direct Support, Repair Parts and Special Tools List for Air Conditioner
TM 38-750	Army Maintenance Management System (TAMMS)

-6. Shipment and Storage

TB 740-93-2	Preservation of USAMEC Mechanical Equipment for Shipment and Storage
TM 740-90-1	Administrative Storage of Equipment

-7. Destruction of Army Materiel

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use

APPENDIX B
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III. (Not applicable).

d. Section IV. (Not applicable).

B-2. Explanation of Columns in Section II

a. Group Number, Column (1). The assembly group is a numerical group assigned to each assembly in a top down breakdown sequence. The applicable assembly groups are listed on the MAC (Maintenance Allocation Chart) in disassembly sequence beginning with the first assembly removed in a top down disassembly sequence.

b. Functional Group, Column (2). This column contains a brief description of the components of each assembly group.

c. Maintenance Functions. Column 3. This column lists the various maintenance functions (A through K) and indicates the lowest maintenance category authorized to perform these functions. The symbol designations for the various maintenance categories are as follows:

C — Operator or crew
O — Organizational maintenance
F — Direct support maintenance

The maintenance functions are defined as follows:

A — Inspect. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

B — Test. To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

C — Service. To clean, to preserve, to charge, t paint, and to add fuel, lubricants, cooling agents, ar air.

D — Adjust. To rectify to the extent necessary t bring into proper operating range.

E — Aline. To adjust specified variable elemen of an item to bring to optimum performance.

F — Calibrate. To determine the corrections to b made in the readings of instruments or test equi ment used in precise measurement. Consists of th comparisons of two instruments, one of which is certified standard of known accuracy, to detect an adjust any discrepancy in the accuracy of the instru ment being compared with the certified standard.

G — Install. To set up for use in an operationa environment such as an emplacement, site, or vehicl

H — Replace. To replace unserviceable items wit serviceable assemblies, subassemblies, or parts.

I — Repair. To restore an item to serviceable co dition. This includes, but is not limited to, inspectio cleaning, preserving, adjusting, replacing, weldin riveting, and strengthening.

J — Overhaul. To restore an item to a completel serviceable condition as prescribed by maintenanc serviceability standards using the Inspect and Repa Only as Necessary (IROAN) technique.

K — Rebuild. To restore an item to a standard a nearly as possible to original or new condition in ap pearance, performance, and life expectancy. This i accomplished through complete disassembly of th item, inspection of all parts or components, repair o replacement of worn or unserviceable element (items) using original manufacturing tolerances an specifications, and subsequent reassembly of th item.

d. Tools and Equipment, Column (4). (Not appl cable).

e. Remarks, Column (5). (Not applicable).

Section II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Functions group	(3) Maintenance functions A Inspect	B Test	C Service	D Adjust	E Aline	F Calibrate	G Install	H Replace	I Repair	J Overhaul	K Rebuild	(4) Tools and equipment	(5) Remarks
1	EVAPORATOR AND CONDENSER FAN FRAME AND PANELS													
	Frame, Evaporator Fan and Panel								O					
	Frame, Condenser Fan and Panel								F					
2	CONDENSER AND EVAPORATOR MOTOR AND BASE													
	Blower Motor and Base	O	O	O		O		O	O	F				
3	CONTROL PANEL													
	Control Panel								O					
	Control Box								O	O				
4	EVAPORATOR AND CONDENSER BLOWER FAN AND HOUSING													
	Blower and Housing	O		O					O					
5	EVAPORATOR FRAME AND PANELS								F					
6	EVAPORATOR COIL VALVES BAFFLES AND DRAIN PAN													
	Evaporator Coil			C					F	F				
	Evaporator Valves				F				F					
	Evaporator Baffles and Drip Pan								F					
7	CONDENSER FRAME AND PANELS								F					
8	CONDENSER COIL DEHYDRATOR, TUBES AND GAGES													
	Condenser Coil			C					F					
	Dehydrator, Tubes and Gages								F					
9	TERMINAL BLOCK AND COVERS		O						O					
10	COMPRESSOR FRAME								F					
11	COMPRESSOR MOTOR BASE CLUTCH AND COUPLING													
	Clutch and Coupling					O			O					
12	COMPRESSOR MOTOR AND STARTER BOX													
	Compressor Motor	O	O	O		O		O	O	F				
	Starter Box		O						O					
13	COMPRESSOR ASSEMBLY	F	F	F		O			F	F	F			
	Air Filter			C					C					

APPENDIX C
BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists items which accompany the air conditioner or are required for instailation, operation, or operator's maintenance.

C-2. General

This Basic Issue Items List is divided into the following sections:

a. Basic Issue Items — Section II. A list of items which accompany the Air Conditioner and are required by the operator/crew for installation, operation, or maintenance.

b. Maintenance and Operating Supplies — Section III. (Not applicable).

C-3. Explanation of Columns

The following provides an explanation of columns in the tabular list of basic issue items, section II.

a. Source, Maintenance, and Recoverability Codes (SMR):

(1) Source code, indicates the source for the listed item. Source codes are:

Code	Explanation
P	Applied to repair parts which are stocked in or supplied from GSA/DSA or Army supply system, and authorized for use at indicated maintenance categories.
P2	Repair parts which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
M	Applied to repair parts which are not procured or stocked but are to be manufactured at indicated maintenance levels.
A	Applied to assemblies which are not procured or stocked as such, but are made up of two or more units, each of which carry individual stock numbers and descriptions and are procured and stocked separately and can be assembled by units at indicated maintenance categories.
X	Applied to parts and assemblies which are not procured or stocked, the mortality of which is normally below that of the applicable end item or component, and the failure of which should result in retirement of the end item from the supply system.
X1	Applied to repair parts which are not procured or stocked, the requirement for which will be filled by use of the next higher assembly or component.
X2	Applied to repair parts which are not stocked. The indicated maintenance category requiring such repair parts will attempt to obtain them through cannibalization; if not obtainable through cannibalization, such repair parts will be requisitioned with porting justification through normal supply chan
G	Applied to major assemblies that are procured PEMA (Procurement Equipment Missiles A funds for initial issue only, to be used as exch assemblies at DSU and GSU level. These assem will not be stocked above DS or GS level or retu to depot supply level.

(2) Maintenance code, indicates the lowest c gory of maintenance authorized to install the li item. The maintenance level code is:

Code	Explanation
C	Operator/crew

(3) Recoverability code, indicates whether serviceable items should be returned for recover salvage. Items not coded are expendable. Reco ability codes are:

Code	Explanation
R	Applied to Repair parts (assemblies and compon which are considered economically repairable at d and general support maintenance levels. Wher maintenance capability to repair these items doe exist, they are normally disposed of at the GS When supply considerations dictate, some of thes pair parts may be listed for automatic return to su for depot level repair as set forth in AR 710-50. V so listed, they will be replaced by supply on a change basis.
S	Repair parts and assemblies which are economicall pairable at DSU and GSU activities and which nor ly are furnished by supply on an exchange basis. V items are determined by a GSU to be uneconomi repairable they will be evacuated to a depot for eva tion and analysis before final disposition.
T	High dollar value recoverable repair parts which are ject to special handling and are issued on an exch basis. Such repair parts are normally repaired or hauled at depot maintenance activities.
U	Repair parts specifically selected for salvage by r mation units because of precious metal content, cal materials, or high dollar value reusable casin castings.

b. Federal Stock Number. This column indica the Federal stock number assigned to the item will be used for requisitioning purposes.

c. Description. This column indicates the Fed item name and any additional description of item required. The abbreviation "w/e", when use a part of the nomenclature, indicates the Fed stock number, includes all armament, equipm accessories, and repair parts issued with the item part number or other reference number is follo

by the applicable five-digit Federal supply code for manufacturers in parenthesis. Repair parts quantities included in kits, sets, and assemblies are shown in front of the repair part name.

d. Unit of Measure (U/M). A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit. This column indicates the quantity of the item used in the assembly group. A "V" appearing in this column in lieu of a quantity indicates that a definite quantity cannot be indicated (e.g., shims, spacers, etc.).

f. Quantity Furnished with Equipment. This column indicates the quantity of an item furnished with the equipment.

g. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* Indicates the callout number used to reference the item in the illustration.

Section II. BASIC ISSUE ITEMS

(1) SMR code	(2) Federal stock number	(3) Description Ref. No. & Mfr Code / Usable on Code	(4) Unit of meas	(5) Qty inc in unit	(6) Qty furn with equip	(7) Illustration (A) Fig No.	(7) Illustration (B) Item No.
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